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THE BRITISH ASSOCIATION.

TENTH MEETING: GLASGOW.

[Third notice.]

BEFORE continuing our Sectional Report, we may observe that, as the week advanced, the warmth of welcome seemed to increase as the natives and strangers got a little better acquainted with each other, and that the meeting concluded in a manner altogether as productive, as harmonious, as auspicious for the future, and as likely to leave a lasting impression and stimulus favourable to the cultivation of science, as any previous assemblage of the British Association.

At first there appeared to be no general feeling among the inhabitants of even curiosity respecting their visitors. The multitude immersed in business, and "minding their ain concerns," cared little or nothing about the influx of mathematicians, chemists, geologists, naturalists, doctors, economists, and mechanicians, who soon began to attract only a trifling notice as they perambulated the unknown streets with books, maps, cards, and papers in their hands, trying to make themselves understood by, and to understand, the persons to whom they happened to apply for some desired information. The difference of dialect, however, imposed almost an impassable bar to this sort of "march of knowledge." Meanwhile the local Secretaries and other gentlemen of Glasgow, who had from the beginning taken an interest in its coming hither, exerted themselves most assiduously, and, upon the whole, most successfully, in carrying into ready effect the complicated arrangements which such a congregation demands. Still several important points were neglected or overlooked. The non-publication of a list of resident members was one of these which caused some inconveniences; and still more loss and trouble were occasioned by the very crude and imperfect manner in which the list of non-resident members was issued. We speak of this feelingly, for none attending the meeting suffered so much from it as those connected with a journal which required extended intercourse with very many of the parties who took an active part in the proceedings; though every stranger must have been more or less affected by it.* The local authorities did not seem to be aware of the extreme value of having this list published daily with correct addresses. We could not obtain the insertion of our own though repeatedly pressed, and the result was extreme disappointment and trouble in collecting the materials for our report. In the list of about 650 names, above 150 were in the same predicament. We trust that such a hinderance to business and intercommunication will never be suffered to occur again.

To compensate it in some measure, an idea which we suggested in the *Literary Gazette*, two or three years ago, was this year carried into execution, and contributed much to the benefit of the meeting. We allude to the printing and circulating every morning a list of the papers read on the preceding day, and of those to be read on the same day. By this species of information every body was led to the Section and subject which it was their wish to attend.

In general, we would say that the matters transacted by the various Sections at this meeting were quite equal to the average. The Geologists, as usual, had a brilliant session; and the Statistics excited a strong degree of popular interest, though some of the questions discussed could hardly be asserted to come within the range of science. The grand difference of opinion, however, upon the treatment of the poor (which, like the Intrusion question, divides the country), and the acknowledged talents of the champions on either side, as well as the expectation of vehement debate, crowded this Section till it overflowed into *the* church with an ample audience. The presidency of Lord Sandon was of peculiar service here. Had there not been a chairman of consummate prudence and intelligence it might have been very difficult to keep the discussion within due bounds. The Section of Physics was also occupied with many great and important investigations,—some of them, indeed, sublime, and almost all of scientific value. Upon the whole, though many curious things are brought forward and lost sight of from year to year as the excitement of the hour passes away, and, from the hurry of time and an attempt, perhaps, to grasp too many objects, a number are very imperfectly developed,—whilst old familiar or unimportant trifles occupy the space, still, with all this evanescency and waste, there is so much of the permanent, solid, and memorable remaining, that nothing short of the most perverse blindness and malice can deny to the British Association the merit of being truly an inestimable friend and ally to Science, not only of Britain but of the civilised world. The idea thrown out at Glasgow of forming a congress of nations on the same principle, with the great Humboldt at its head, and every country sending its representatives to the meeting, will, if it can be realised, be another mighty measure for the diffusion of knowledge, and of peace and goodwill amongst the whole family of mankind. Many difficulties certainly stand in the way; but zeal and perseverance may overcome them all. With these remarks, and reserving others on different matters collateral with the Glasgow wise-week, we conclude for the present; and proceed to our journey-work.

FRIDAY.

SECTION A.—*Mathematics and Physics.*

Papers and Communications.

1. Sir David Brewster's 'Report on Meteorological Observations at Kingussie and Inverness.'
2. Mr. Osler's 'Comparative Force of Wind during the 24 hours.'
3. Mr. Caldicott's 'Hourly Meteorological Observations at Trevandrum.'
4. Sir David Brewster, 'On a Blue Sun at Bermuda.'
5. Mr. John S. Russell's 'Report on Waves.'
6. Professor Kelland, 'On Mathematical Theory of Waves.'
7. Mr. Peebles, 'On Expressibility of Roots of Equations.'
8. Sir David Brewster, 'On Professor Powell's Measure of the Refrangibility of the lines G and H in the Spectrum.'
9. Professor Powell, 'On a Case of Interference.'

Whilst the diagrams, &c. were being prepared for the Meteorological Report, Sir D. Brewster read a communication from Colonel Reid, 'On the Appearance of a Blue Sun at Bermuda,' where the gallant Colonel now is, administering the government, prosecuting his scientific inquiries, and adding to his already high acquirements. The communication bearing date 17th August, 1839, described, and requested, an explanation of the singular phenomenon familiar to all at Bermuda; white objects appearing blue, and all others taking a similar hue. After stating the fact, which he had had, since at Bermuda, a good opportunity of observing, viz. that the revolutions of a water-spout near the surface were like the hands of a watch, Colonel Reid observed that Dr. Hardy, the present Collector of Customs, when recently at sea fifteen miles east of Bermuda, a hurricane raging over St. Vincent, saw all objects of a greenish colour. But the most remarkable blue sun occurred in 1831, which Dr. Hardy described. The night previous to the 3d of August, 1831, huge masses of clouds had collected, threatening a prodigious fall of rain, but no indications of wind or of a storm. During the night the thunder and lightning was severe; in early morning, some time after he had risen, the light became so dim, and every object in the room looked so blue, that he apprehended a sudden failure of sight. He communicated this to his family, but they also saw every thing of the same blue colour. Dr. Hardy then looked out;—the day was tranquil, the purely white sails of a vessel near were, to the sight, a deep blue; and the sea, to the coast of America, looked yellow.

Sir David Brewster was not aware that the fact, although frequently observed, had ever been accounted for. The phenomenon occurs when halos are formed, and is produced in a way analogous to the colours of mixed plates, which are caused by fringes of rays of light, portions of different degrees of refrangibility. These colours, so brilliant, might be produced by a lather of white soap between two plates of glass; the bubbles will be small vesicles, or cavities of air, through which the light will pass, and which afford different media of different degrees of refrangibility, therefore interference and therefore colour. It is easy to conceive that vesicular globules exist in the atmosphere, and consequently, that light, passing through different media, will, and does, produce the phenomena of mixed plates.

Professor Forbes noticed that the communication did not state whether the disc of the sun was visible, and of a blue colour. This fact, however, is well known; and was last observed, he believed, by M. Arago, at Algiers. The explanation given by Sir D. Brewster had been already suggested by M. Bebinet, and when two such authorities agreed he thought there was no doubt but that the cause was clearly established.

Professor Stevelly asked whether it was essential that the particles should be of the vesicular form, as a difference of opinion existed as to the construction of atmospherical vapours?

* At the end of the list the following appeared:—"It is requested that members whose addresses in Glasgow are omitted, or incorrectly reported, will give immediate intimation of the same at the appointed place, in the Reception Rooms;" to which, as far as our experience goes, it might have been added, "of which no use whatever will be made!"

Sir D. Brewster said that what he had stated involved no theory. It was well known, however, that a high storm on the sea-coast drives vesicles up into the atmosphere. At St. Andrew's he had observed the sea raised in this manner, and the vesicles falling, burst, and left marks of salt water. The blue may be seen with a distinct blue image in the centre through films of sulphate of lime, in which are cavities either hollow or containing water: he believed water.—Here the conversation dropped.

An abstract of the Report No. 1, to shew its nature, and the results obtained, was then read by Sir D. Brewster, who selected two stations as best suited for the above purpose, Inverness and Edinburgh, where the observations had been conducted under the superintendence of Mr. Rutherford and Mr. M'Kenzie since November 1838. The results of the observations during the winter months were submitted to the Association at Birmingham; but now the observations themselves were brought up in two quarto volumes—a work of stupendous labour. The variations of the thermometer; the height and mean of the barometer; the character and direction of the wind; the number and nature of the auroræ boreales observed at these two stations, when compared with results obtained at Leith, Plymouth, Padua, and Philadelphia, exhibit traces of meteorological laws which Sir D. Brewster said will lead us to detect the phenomena of planetary action. The table of mean temperatures (the annual mean at Inverness is 45½°) shews remarkable results. The temperature for one day presents capricious and irregular variations,—curves so irregular that there is no trace whatever of a curve. When, however, 76.000 observations are combined, these irregularities assume a regular curve. Thirty-six thousand hourly observations give an extraordinary identity of critical interval. Beginning from the north, in the order of latitude, the critical interval at Inverness was $11^h\ 13^m$; at Keordin, $10^h\ 44^m$—this is a considerable difference; but it may be in consequence of its altitude (750 feet) above the sea; at Leith, $11^h\ 15^m$, or $11^h\ 20^m$; at Plymouth, seventy-five feet above the sea (here only even hours are given), 11^h; at Padua, $11^h\ 14^m$; at Philadelphia, $11^h\ 20^m$; in Ceylon, at Trincomalee, $11^h\ 5^m$; at Colombo, from observations made by Major Ord every two hours, differing therefore from the others, $10^h\ 55^m$; at Kandy, 1600 feet above the level of the sea, 11^h—but these have not been carried through accurately; at Trevandrum, 170 feet above the sea, at an observatory erected and furnished by a native prince, in consequence of the reports of the British Association, as explained to the Prince of Travancore by Mr. Caldicott, the critical interval was $10^h\ 56^m$, agreeing with Colombo. It does not appear that the difference of level above the sea is sufficient to account for the differences; and some are hostile to the idea that altitude affects the critical interval. But it is a remarkable circumstance that the curve at Kandy agrees with the curve at Plymouth, as if elevation above the sea produced such an effect as so many degrees of south latitude. Thus to temperature Sir D. Brewster confined his remarks. The observations, he stated, made at Trevandrum were only reduced this morning, and they exhibited a remarkable annual curve.

Professor Forbes, who had been examining the projected curves and tabulated details, said there was one point clear from the results; viz. that they exhibited a probability of fixed laws, as fixed even as astronomical laws. The first impulse to these inquiries was given in this country by Sir David Brewster; and he (Professor Forbes) would inform him that the coincidence he had just described extended to two cases which had not come under his notice—at Nova Zembla and North America, both near the poles of maximum. No constant quantity is as yet known; but, if once established, it must be general.

Sir D. Brewster rose to supply an omission. Mr. Rutherford, the first so to do, had projected the curve of calm, together with those of wind and temperature, and they exhibited a remarkable relation.

Mr. Osler then stated that his anemometer at Birmingham had been in full operation nearly four years, and he thought his observations were sufficient for reduction to shew if there be laws for the wind. He described his mode of tabulating. His diagrams were beautiful, and shewed the comparative force of the wind for the day, month, seasons, and year. The results given were that an increase of temperature precedes an increase of wind; and it is probable that certain winds blow at certain hours; but sufficient observations to establish this probability have not yet been made.

Mr. Scott Russell suggested (and described the arrangement as used by himself) the substitution of fluid pressure for the spiral spring of Mr. Osler's anemometer.

'Abstract of Mr. Caldicott's Communication of Hourly Meteorological Observations at Trevandrum.' The author observed, that having had an opportunity in India of forwarding an inquiry which the British Association has considered to possess great interest, viz. that into the thermometrical, barometrical, and hygrometrical condition of the atmosphere within the tropics; it was with feelings of great pride and pleasure that he was enabled by his present visit to this country to offer to the present meeting of that eminent Association a series of hourly observations of the thermometer, barometer, and wet-bulb thermometer, carried on under his direction and superintendence, at a situation only 8¼° north of the equator. The author then proceeded to describe the circumstances under which the observations have been made, in the following terms:—

"In the beginning of the year 1837 it devolved on me to undertake the direction of an observatory then recently established at Trevandrum, in the south of India, by his highness the Rajah of Travancore (a young native prince of that country, of whom, for his liberal patronage of science, his munificent encouragement of education among his subjects, and for his beneficent rule, it is impossible to speak too highly), and noticing among the recommendations promulgated by the British Association, that a set of hourly meteorological observations within the tropics was considered highly desirable, I thought the opportunity a grand one for supplying this desideratum. I accordingly explained the matter to his highness, and with the liberal confidence which I have ever experienced from him, was immediately provided with the necessary means for accomplishing my purpose. I have, therefore, no other merit to claim (with respect of these observations) than that of a diligent perseverance in the task I had imposed on myself."

Mr. Caldicott then described minutely the building in which the observations were made, the instruments used, and the registers which accompany his communication; informing the meeting that the observations have been made every hour since the commencement of June 1837; and that they are intended by him to be continued for the period of five years from their commencement. The situation is described to be in the latitude 8° 30′ 35″ north, longitude $5^h\ 8^m$ east of Greenwich, 170 feet above the mean level of the sea, and distant from it in a direct line about two miles. Every precaution appears to have been taken for the protection of the instruments from all interfering influences; and of the observers (all natives of India), Mr. Caldicott remarks, that "after the first difficulty of instructing them is surmounted, their patient, temperate, and diligent habits peculiarly fit them for the office here required of them, and I have always found those who have been selected for the duty fully as trustworthy as, I imagine, is any class of persons to whom such observations are usually intrusted."

The registers are arranged in monthly tables, and contain, among other interesting determinations, the following particulars, clearly shewn, and prepared for any investigation to which they may be considered applicable, viz.:—

In Temperature.

1. The mean of each hour for the month.
2. The mean of each day of the month.
3. The above two determinations for each period of ten days.
4. The mean range for the month for each ten days.

In Pressure.

1. The mean pressure of each hour for the month.
2. The mean pressure of each day of the month.
3. The same quantities for each period of ten days.
4. The maximum and minimum pressure for each day, with the extreme variation for each day.
5. The four semi-oscillations for each twenty-four hours, with the mean values of these for the month.

In Humidity.

1. The temperature of the air each hour (repeated from the register of "Temperature").
2. The depression of the wet-bulb thermometer for ditto.
3. The due point for ditto, calculated from Professor Apjohn's formula, disregarding his correction for pressure.
4. The mean of all these for each day.
5. The quantity of rain for every twelve hours.

Besides these registers, the author presented two tables, drawn up in the form first adopted by Sir David Brewster, shewing for the complete year of the observations, viz. from June 1837 to June 1838,

1. The daily and monthly mean temperature, from 8760 observations.
2. The mean temperature of each hour for each month, and for the whole twelve months, from ditto.

Also two others, shewing for the same period,

1. The daily and monthly dew points, also from 8760 observations.
2. The mean dew point of each hour for each month, and for the whole twelve months, from ditto.

The first two tables give for the mean temperature of the station 78° 89′, and the other two give for the mean dew point 71° 78′.

The barometric registers give, by a mean of all the diurnal semi-oscillations for the same period, the following results:—

		Inch.
Fall between	10 A.M. and 4 P.M.	0·109
Rise	4 P.M. .. 10 A.M.	0·108
Fall	10 P.M. .. 4 A.M.	0·071
Rise	4 A.M. .. 10 A.M.	0·073

Times of maxima between the hours of nine and ten, morning and evening.

Times of minima between the hours of three and four, afternoon and morning.

Mr. Caldicott concluded his communication with a notice to the meeting that he was about to return to his post in India, amply furnished with meteorological, magnetical, and astronomical instruments; and added that, should the Committee of the Physical Section of the British Association see fit to honour him with any suggestions as to points in meteorology, or any other branch of the physical sciences, which his local situation and means might enable him

to elucidate, or be of use in, he would feel proud to receive its instructions, and would do all in his power to forward its objects.

Professor Forbes said that the observations exhibited admirable care, and that the results were distinguished in a peculiar manner. Some remarks with regard to the dew-point and Apjohn's formula provoked a discussion, in which Sir D. Brewster, Mr. Espy, Major Sabine, &c., took part; but as the subject will come before our readers in a more regular form, we pass on to

Mr. Russell's report 'On Waves.' The chief business of the Committee during the past year had been to carry the level line from Stirling to Leith, compare observations, and reduce the results. Mr. Russell described and illustrated the peculiarities of the tidal waves in the Frith of Forth, the extraordinary form they assume, and the phenomenon of two high waters of one tide; and attributed them to the slope of the bed, the level line, and to two tidal waves. This latter circumstance was in relation to the tidal discussions of Whewell and Lubbock. From their chart of cotidal lines it appeared that there were two great tidal waves in the Forth; the one passing through the British Channel to the east coast and German Ocean, and the other round the Orkneys. The two meet in the Thames, coincide, go up together, and cause one high water; but the channel tide-wave arrives at the Forth about three hours before the northern one, but is overtaken by the latter at Stirling, where the two coincide, and a single high water results; although all up the Forth two high waters occur, and sometimes three, which, however, has not been accounted for. The first arrives to a shallow channel, and is therefore greatly retarded, and the hump on the crest is observed; whereas the northern one comes to deeper channel, and, its velocity increased, moves much more rapidly than the former, overtakes, and becomes incorporated with it. It has been proved beyond doubt that a large wave can overtake a small one, pass through it, and leave it behind; that is, that first one wave shall be seen, then two, then one again. In conclusion, the Report briefly alluded to the mechanism of the wave, of translation, and the mathematical results worked out by Professor Kelland; also to the beneficial results arrived at with regard to the forms of vessels: but both these will be noticed hereafter in their regular order.—The Committee considered this their final Report.

Professor Whewell acknowledged the high interest of these curious facts, and the great probability of their close relation to two tidal waves; but also, he observed, it is probable that other circumstances coincide and give depth to the water, &c. &c. It was difficult to improvise a discussion on such a subject, although tempting; the first thing that presented itself, as possibly an influence, was the age of the moon. Looking at each projected curve in the diagrams before him, certain waves always preserve the same forms; and, probably, throughout the whole lunation others change their character. For instance, in April, from the 5th to the 8th, the wave previously double was single; on the 10th, apparently, and on the 11th, clearly and decidedly double again. He then suggested a comparison to be instituted for every day of the semi-lunation, to shew what relation each day of the moon had to the facts; and for this further tidal observations would be required.

Mr. Russell, in explanation of one or two points, referred to Whewell's map of cotidal lines; and observed that the tides in the German Ocean appear capricious, running in various directions. In one place they were marked as travelling in a circle, making for the coast of Norfolk and Suffolk, and thence sweeping round to the coast of Holland. As Mr. Whewell observed, great proof of the correctness of these tidal lines has lately been afforded; it was conceived that if the tides made as projected, in the central point of this sweep there would be no tide, as in the centre of a wheel there is no motion. A letter from the Admiralty had announced the discovery of this point where there was no rise.* He had hoped to lay the particulars before the Section, but the first letter, containing full details, had not been received. This is, indeed, a striking proof of the truth of the theoretical views on waves.

Professor Kelland next submitted his 'Mathematical Investigations of the Theory of Waves.' His memoir has already been published. For this reason, therefore, and also because, as Professor Kelland observed, "the formulæ were too abstruse to put altogether into oral relation," it will be sufficient to observe that all the problems solved gave facts precisely those resolved by experiment. This was confirmed by Mr. Scott Russell.

The three last papers were then read, but were of a character too abstruse for popular illustration.

SECTION B.—*Chemistry.*

Papers and Communications.

1. Prof. Thomson 'On the Chemical Manufactures of Glasgow.'
2. Mr. Connell's Additional 'Observations on the Voltaic Decomposition of Alcohol.'
3. Prof. Graham's 'Notice of the New Chemical Views of Prof. Liebig, on Agriculture and Physiology.'
4. Dr. R. W. Glover, 'On a New Process for obtaining Hydrobromic Acid, and Hydriodic Acid.'
5. Prof. Bunsen, 'On the Compounds of a New Radical called Kakodyl.'
6. Dr. Mohr, 'On a New Node of preparing Morphia.'
7. Mr. Sturgeon, 'On a Peculiar Class of Voltaic Phenomena.'

A specimen of Dr. Gregory's muri-oxide (respecting which a communication was made yesterday) was handed round for the inspection of the Section.

Dr. T. Thomson was then moved from the chair to read his paper 'On the Chemical Manufactures of Glasgow,' and it was provisionally taken by Professor Graham. The paper itself was long and interesting, detailing the methods by which these important manufactories are carried on, without, of course, divulging any of the peculiar processes which are kept secret by their proprietors. It will be seen, therefore, that an account of those which are generally known, even with the luminous explanations of this able chemist, could convey no new intelligence to parties concerned in similar undertakings, and would be of less value to the public at large than to such an assembly as attended this lecture. We need not then enter upon the details, but merely state that the exposition fully illustrated the great manufactories of iron, sulphuric acid, bleaching powder or chloride of lime, alum made at Hurlet and Campsie, precipitate of potash, achromate of potash, tartaric acid, acetic acid, pyroxylic spirit, iodine, soap, bleaching of cotton cloth, Turkey-red dyeing, glass-making, cudbear and gas, and all the other leading products for which this enterprising and wealthy community is celebrated.

Professor Graham expressed the thanks of the Section to Dr. Thomson for collecting such a mass of valuable information on the manufactures of Glasgow and neighbourhood.

Mr. Connell, 'On the Voltaic Decomposition of Alcohol,' endeavoured to shew that by dissolving a small quantity of potassium in pure alcohol, and then subjecting the compound to voltaic action, water was obtained.

Dr. L. Playfair read the next paper, which was by Dr. R. W. Glover, 'On a New Process for obtaining Hydrobromic Acid, and Hydriodic Acid,' and proposed the employment of bromite and iodine of bromine in atomic proportions, as a convenient method.

Professor Bunsen, 'On the Compounds of a new Radical Compound, called Kakodyl.' The process by which this compound is obtained is exceedingly dangerous, and the author, in his experiments, has been several times severely injured. Arsenic is a principal ingredient.

The next paper read was by Dr. Mohr, 'On a new Mode of preparing Morphia.' The principle of the new method of preparing morphia consists in dissolving the morphium in caustic lime by means of heat, and precipitating the filtered liquor by muriate of ammonia. The lime is neutralised by the muriatic acid of the salt, ammonia set free, and the morphia precipitated. In this process the morphia is obtained in a crystalline and very pure state, without the alcohol. This mode of operating is as follows:—The opium is dissolved in boiling water and strained, this operation repeated twice, the liquors concentrated by evaporation, boiled with caustic lime, strained again, and mixed while hot with powder of sal ammoniac.

Dr. Gregory said he had had a great deal of experience in preparing morphia, and he was quite satisfied that Dr. Mohr's was the best, both for preparing small quantities and for class experiments. He was sure it would be universally adopted as soon as known.

Dr. R. D. Thomson read a paper by Mr. Sturgeon, 'On a peculiar Class of Voltaic Phenomena.'—The Section then adjourned.

SECTION C.—*Geology.*

Papers and Communications.

1. Professor Johnston, 'On Chemical Geology.'
2. C. Lyell, Esq. 'On Ancient Sea Cliffs and Needles of Chalk in the Valley of the Seine in Normandy.'
3. A. Ramsay, Esq. 'On the Geology of Arran.'
4. W. Keir, Esq. 'On the Geology of Castle Hill, Ardrossan.'
5. W. Sanders, Esq. 'On a Raised Beach at Woodspring Hill.'

Professor Johnston's paper 'On Chemical Geology' affords one of those instances of the conjunction of sciences which is so truly valuable in all useful pursuits, that we beg to direct particular attention to it, as one of the principal features of the meeting. The very able and distinguished Chemist of the University of Durham, indeed, discussed a subject of such general interest, and produced so much information respecting the componency of various coals, that we are sorry to have been obliged to postpone it from even our earliest Number which reports these transactions. In this report the author considered, 1. The characters, classification, and constitution of the different kinds of coal which occur in various parts of the globe. 2. The origin of coal, which he considered to be unquestionably derived from the decay of vegetable matter. 3. He then explained the general law, according to which vegetable substances undergo decay in connexion with air and water. 4. The next point adverted to was the *relative* constitution of the different kinds of coal, as expressed by chemical formulæ. This relative constitution was represented in the following table:—

* This remarkable fact is communicated by a captain of the British navy now employed in the se seas: the precise point, giving the longitude and latitude of the central calm, did not transpire.—*Ed. L. &c.*

Table, exhibiting the approximate Constitution of several Varieties of Coal, and their Relation to Lignin, and to each other, to illustrate Mr. Johnston's Report on Chemical Geology. Part I.

Name.	Formula.			Loss compared with Lignin.			Loss compared with preceding variety.		
	C	H	O	H	O		H	O	
Lignin	100	126	126						
Dossil wood (Utrecht)	100	107	79	19	47	= 31 HO + 16 O	31 HO	16 O	
Do. (Cassel)	100	97	70	29	56	= 41 HO + 10 O	10 H	8 H	
Imperfect lignite (Greece)	100	78	48	48	78	= 50 HO + 30 O	9 HO	22 O	
Lignite (Lower Alps)	100	70	38	56	88	= 58 HO + 32 O	8 HO	10 O	
Jet	100	68	28	60	100	= 60 HO + 40 O	2 HO	8 O	
A steam-coal: Dry blazing coal (Blazey)	100	65	36	64	102	= 64 HO + 38 O	2 HO	2 O	
Imperfect cannel (Clifton)	100	64	16	64	112	= 64 HO + 48 O	HO	9 O	
Cannel (Wigan)	100	64	13	64	115	= 64 HO + 51 O		3 O	
Splint (Willington)	100	60	11	68	117	= 68 HO + 49 O	2 HO	2 H	
Caking-coal (Newcastle)	100	56	8	72	120	= 72 HO + 48 O	HO	H	
A steam-coal: Hard bituminous (Rive de Gier)	100	52	6	76	122	= 76 HO + 46 O	2 HO	2 H	
Anthracite: A (Mayenne)	100	42	4	96	134	= 96 HO + 38 O	2 HO	18 H	
B (Welsh)	100	33	3	95	125	= 95 HO + 30 O	HO	8 H	
C	100	24	3	104	125	= 104 HO + 21 O		9 H	

In this table, the two remarkable points particularly dwelt upon by the author were, — 1. That from the formulæ it appears that the several species of coal form a series, indicating a succession of steps from the unchanged woody fibre (Lignin) to the anthracitic coal, in which all traces of organisation have entirely disappeared. 2. That in the progress of the decomposition a point is at length reached (see *splint coal, Willington*, in table), when, instead of water and oxygen, water and hydrogen are evolved. Up to this point the vegetable matter gives off, by its decomposition, water and carbonic acid only; hence, in mines of brown and cannel coals, carbonic acid is the principal gaseous substance given off by the coal. Beyond this point, however, water and light carburetted hydrogen (*marsh gas* or *fire damp*) are given off; and hence the evolution of inflammable gas in the mines of certain bituminous coals (*splint, caking coal*, &c. of the table), and in them only. These observations serve to illustrate very beautifully the production of the several kinds of coal, and of the gaseous and other substances obtained in connexion with it in the various coal mines. The last division of the report was devoted to the consideration of the question as to the mode by which the vegetable matter from which the coal is formed had been derived? whether, for example, it had been brought from a distance as *drift*, or had grown on the spot? On this point the Professor considered the *balance* of evidence, *of all kind*, to be in favour of the opinion that the vegetable matter grew on the localities in which the coal is now found. This report was followed by an interesting discussion, in which Mr. Delabeche, Dr. Buckland, the Marquess of Northampton, and various other members, took part.

The President said, that this was the first chemical and geological paper that had been read before any geological society. The writer was well known by his great chemical and geological knowledge, and they had just had an opportunity of witnessing the extreme value of having the two displayed in combination.

Dr. Buckland held the views propounded by Professor Johnston to amount almost to a demonstration, and regarded them as an epoch in the investigation of the origin of coal. With respect to the opinions of practical men as to the formation of the Newcastle coal-field, the only criticism he was disposed to make was this—it was urged that, because there were seams of coal only one inch thick, they could not have been produced from drifted trees. But *non sequitur*; the vegetable matter might not have been trees, but a smaller vegetable—the leaves of ferns, or aquatic plants—floated from a distant lake or forest. The argument against drifted trees might be true as far as it went; but it was not true altogether. He believed that other beds of coal were the result of vegetable matter drifted from great distances. Instances of this kind were clearly proved by the pine found in Craigleith quarry, and other fossil trees embedded in sand, and completely cut off from the ground below. The truth probably lay between extreme views on both sides.

Professor Phillips instanced a few cases he had known of trunks of trees denuded of their leaves and branches and surrounded by coal, and of the stem of a plant that was found in conjunction with the root of another. He stated these things to shew that different facts required to be kept in view in concluding upon this matter. He congratulated the Section on the interest and importance of the paper they had heard; it proved that geologists were willing to call in the aid of all the correct sciences to test and corroborate the principles of their own.

The Marquess of Northampton offered a few remarks on the different qualities of wood, as promoting or retarding the process of decompositions. He recommended the subject to the consideration of botanists.

Dr. Buckland reminded the noble Marquess of the interesting experiments of Dr. Lindley on the vitality of plants. Dr. B. also referred to the fact that none of the grasses had been ever yet found in any kind of coal.

Mr. Featherstonhaugh described the anthracite coal of the State of Pennsylvania, and mentioned that he had observed it in a filamentory form like thousands of small coral branches. He did not comprehend how such a formation could be included in the category of coals of vegetable origin.

After some farther discussion of this point, the conversation on the paper terminated.

Mr. Lyell gave an interesting essay on the sea-cliffs and needles of chalk in the valley of the river Seine; but we did not observe that it led to the statements of any new geological facts or results. The formations examined by Mr. Lyell did not differ from the sea-marks and deposits of similar in other parts of the globe; but confirm all the data which the science has deduced from their position and appearance.

Mr. Ramsay, to whom the meeting are much indebted for an admirable model of the Isle of Arran, and a collection of its minerals and fossils arranged around the room where it was exhibited, explained a fine map and sections of the island; but as we shall have the satisfaction in our account of to-morrow's proceedings to enter into a more stirring eye-witness description of similar remarks, we shall simply say that Mr. Ramsay demonstrated the geological structure of his subject with uncommon perspicuity and accuracy.

Mr. W. Keir read the paper announced 'On the Geology of the Castle Hill at Ardrossan, on the opposite coast of the Clyde.'

SECTION D.—*Zoology and Natural History.*

Papers and Communications.

1. Sir John Dalzell, 'On the Loss and Regeneration of Organs discharging the Functions of the Head and Viscera, in the Holothuria and Amphitrite, with Drawings.'
2. Mr. James Wilson, 'On Insects from Persia.'
3. Dr. Aldridge, 'On the Pollen of Plants.'
4. Mr. Babington's 'Notice of Cuscuta Ejulinum.'
5. 'Report of the Committee on Radiate Animals.'
6. 'Report of the Dredging Committee.'

P. J. Selby, Esq. in the chair.—The business of the Section opened with a paper by Sir John Graham Dalzell, 'On the Regeneration of Lost Organs by two Marine Animals, the Holothuria and Amphitrite.' He described the holothuria as resembling a sausage or cucumber in shape, with ten beautiful red branches surrounding the mouth, and above 2000 suckers covering the body. The head of this animal, including the branches, mouth, throat, and intestines, were sometimes separated from the body; but the animal did not die—it lay at rest for several months, when the whole lost parts were found to have grown again. This loss might happen more than once—yet the animal would become again entire, and the new organs were seen discharging the same functions as the old. Further, there was a certain species of holothuria which divided spontaneously through the middle. Each half then became perfect and entire. A single specimen produced above five thousand eggs. Sir John next described the amphitrite as of a serpentine form, a foot in length—the head consisting of eighty fleshy feathers, disposed as a funnel or shuttlecock, three inches deep. This creature dwells in a black tube, manufactured by itself, of a kind of composition which it knows how to make. He shewed how the observer could induce it to work—that every fleshy feather consisted of 500 hairs, bordering the shaft; that these collected invisible materials suspended in the water, united them with glue from its month, and plastering them on its tube, smoothed them down with two trowels provided by Nature on its body. That 40,000 instruments were thus all employed in the work at once. If this industrious creature lost its head, a new head would grow. Nay, if a fragment sundered from the extremity of its serpentine body, the same singular feathered apparatus would be generated to perfect the fragment. Sir John shewed, also, that the elements of a new head resided in different parts of the body: of two sections from the lower extremity, each generated a head, so that besides the original plume or head of the entire animal, two new plumes on the separated parts existed—all three at once. Sir John interspersed his narrative with various remarks on the works of creation, and concluded by an appropriate apostrophe, demonstrating the protective cares of Providence over the humblest beings.

Dr. Fleming expressed a hope that Sir J. G. Dalzell would be induced to publish the great mass of interesting matter he had collected on this subject, which would be a valuable addition to the animal biography of Europe. After some observations from Mr. Forbes and the Chairman to the same effect, Sir John expressed his acquiescence in the unanimous wish of the Section.

Mr. James Wilson exhibited a number of rare and splendid specimens of insects from Persia, from Java, and Serampore in the Bengal district. They were extremely interesting, as exhibiting their geographical distribution,

and those from Persia particularly, as shewing how far south the European insects are found.

Mr. Forbes read a paper from Dr. Aldridge, illustrated by diagrams, 'On the Pollen of Plants.'

Mr. Babington stated, that he had found the *Cascular epilinum*, or flax dodder, at Barrishoole, in the county of Mayo, Ireland; and, also, in a field near the Crinan Canal in Scotland. He also stated, that it had been introduced into this country with the seed of the flax from the north of Europe, and that there was no doubt of its being distinct from the *C. Europæa* of Linnæus.

Radiate Animals.—Mr. Patterson read the 'Report of the Committee on Radiate Animals,' for which 50*l.* was granted at the Birmingham meeting. The Report stated that one portion of the Committee's labours was superseded by the investigations, either published, or in course of publication, of individuals connected with the British Association; and that part which remained to be treated, namely, the Acalipha, required the assistance of an individual uniting in his own person the qualities of an artist as well as those of a naturalist. The Committee, therefore, having made their drawings, begged to discontinue the further prosecution of the subject. The drawings were exhibited.

Mr. Forbes brought up the Report of the Committee for investigating the marine fauna of Britain, especially the fossils of the pleiocene period, by means of the dredge, for which a grant of 60*l.* was made at Birmingham. In consequence of the badness of the weather, and other causes, they had been enabled to expend but a portion of the grant, with, however, most interesting results. A series of dredgings had been conducted on the west coast of Ireland, by Mr. Thompson, Mr. Bull, and Mr. Forbes; in the neighbourhood of Belfast, by Mr. Patterson; and on the coasts of the Isle of Man, by Mr. Forbes. The results had been carefully noted down in papers prepared by the direction of the Committee, the number of species and their associations, the comparative numbers of living and dead specimens, the ground depth, locality, and region, all being recorded. On the west coast of Ireland, the testacea, regarded as characteristic of the southern districts in Britain, and on the east coast, are found extending their range far to the north. One district, that of Connemara, presented an exception, agreeing in the character of its fauna with the loughs of the Highlands of Scotland. The species of testacea observed were very generally distributed; those in the region of laminariæ were generally the same region on the east coast, but such as inhabited the region of corallines were more southern in character. The sandy tracts examined were very scant in specimens; muddy bottoms abounded in bivalve mollusca, and the gravelly in univalves. Scallop and oyster banks were not met with; indeed, no instance of a true shell-bank was observed. Dead shells were generally more abundant than living. On the Manx coast, a great bank or bed of scallop and other shells ran from opposite Peel to the point of Ayr, a distance of seventeen miles or more. The proportions of dead and living shells on it are about equal. It varied in distance from the shore from half a mile to five miles. Between it and the shore was a great tract of sand, with accumulations of boulders, giving attachment to fusi towards low-water mark. Animals were rare on this sandy track, but abundant on the shell bank. The coast with which this bed ran parallel was of pleiocene marl and sand, in places exhibiting traces of a similar shell-bank to that at present existing in the sea. The characteristic shells of the fossil beds are, however, altogether wanting in the recent. The east coast of the Isle of Man presented a different character. The dredging on the east coast of Ireland was entirely in the neighbourhood of Belfast. Dead shells were found much more numerous than living, except in the case of *Nucula margaritæ*, which was the only species found very abundant.

[This paper did great honour to the diligence and acuteness of the reporters; and may, perhaps, appear more at large in our columns.]

In our notice of this Section for Thursday we were compelled entirely to abridge Mr. Lankester's paper 'On Plants and Animals found in the Sulphureous Springs in Yorkshire,' of which we now copy a more detailed, though still a very brief, notice.

The inorganic ingredients of mineral waters have been closely investigated, but so much attention has not been given to the organic matters they frequently contain. Continental chemists have described various organic substances, under the names of *Glairine, Baregine, Zoogene*, animal and vegeto-animal matters, &c. In the sulphureous waters of Harrowgate and Askern, a plant described by Dillwyn as *Conferva nivea* is frequently found; and the author has recognised in the organic filaments described by Dalbery and others, the early state of growth of the *Conferva nivea*. In Harrowgate a *Conferva* abounds, having a peculiar structure similar to that of *Oscillatoria*. These *Confervæ* quickly decompose, giving rise to a variety of singular secondary compounds, which have led to the supposed existence of the various substances before alluded to. Vegetable matters existing in these situations have been before recorded, but no distinct notice of animalculæ occurs. The author described two new animalcules which he had discovered, forming a beautiful rose-coloured deposit, in the sulphur wells of Harrowgate and Askern. So constantly do these animalcules occur in sulphureous waters, or districts where sulphuretted hydrogen exists, that the latter may be always inferred from the presence of the former. The animalculæ appear to be at present undescribed, but one of them resembles the *Astasia hæmatodes* of Ehrenberg, which he found producing a rose-coloured deposit in Siberia.—Specimens and drawings of the animalcules and plants were exhibited to the Section. After pointing out the advantage derived of late years by tracing the analogies of the different numbers of the zoological scale, and the adoption of the circular arrangements of Systematic Zoology, he proceeded rapidly to shew that in the particular class of fishes very erroneous views had been promulgated under the authority of names the most distinguished in science, and more particularly by the illustrious Cuvier. Restricting his observations to the skeletons of fishes, and principally to the analogies of the similes of higher vertebrals, he shewed that the pectoral fin had been mistaken for the anterior or respiratory limb, and that more correct induction and observation would easily shew that there was a much stronger analogy between it and the pelvis arch and posterior extremity. According to Cuvier (whose opinion he respectfully dreaded to dissent from), the pectoral fin was supported, 1. By a clavicle composed of two pieces, with a coracoid process, frequently also found double. A single bone represented the humerus, the radius and ulna, and carpus and phalanges; also two bones, four smaller specula, to which were attached the rays of the fins. Viewing this fin as the analogies of the leg or posterior extremity, the upper portion of the scapula represents the pelvis bone, or *os innominatum*, connected with the femur by means of a beautiful acetabular joint. The tibia is the largest bone of the circle, its very largely developed internal malleolus meeting with that of the opposite side under the head, forms a complete circle. The bone mistaken for the coracoid process of the scapula is truly the tibula (the leg being turned has thrown it internal); and the foot with its sole anterior. The tarsus is then traceable with the usual character of the higher vertebrals, where it is always easy to trace a strong analogy, both in form and function, with the forearm and carpus, and it is this which has tended to mislead naturalists. He then pointed out that the opercular bones were the analogies of the anterior extremity; and that in the osseous fishes the branchial respiration was always connected with this form; and that in the porteus, where both pulmonic and branchial circulation existed, both the specular circle and the scapular clavicular arch and arm existed; and that in the cartilaginous fishes, where the respiration was different from both, the scapular clavicle and anterior extremity were largely developed with the pelvis and leg, also found in connexion with the lower part of the spine. Thus, in this class of fishes itself, it is easy to prove that the pectoral fin of ichthyologists is really the leg, and that the opercular bones represent scapula, clavicular arch and arm, or respiratory limb.

SECTION E.—*Medical.*
Papers and Communications.

1. Dr. Alison, 'On Certain Inferences which may be drawn from the Study of the Nerves of the Eye-ball.'
2. Dr. Newbigging, 'On the Therapeutic Effects of Croton Oil in certain Nervous Diseases.'
3. Dr. Lawrie, 'On the Results of Amputation.'
4. Dr. Reid, 'On Blood-vessels of Mother and Fœtus (human).'
5. Dr. Glover, 'On Effects of Bromine, and its Compounds.'
6. Dr. Thomson, 'On Opacity of Cornea produced by Sulphuric Acid.'
7. Dr. Reid, 'On Medulla Oblongata.'

Dr. Watson in the chair.—The first paper was postponed in consequence of Dr Alison's engagement in the Statistical Section.

Dr. Eric Mackay, of Birmingham, then read a paper highly commendatory of the medical properties of the Matias bark of Columbia, South America; and Dr. P. Newbigging, of Edinburgh, and others, stated that they had successfully used this new bark. In answer to a question by Dr. Seargent of Dublin, Dr. J. H. Balfour stated that, from the appearance of the bark, he was of opinion that it belonged to the natural family *Winteraceæ*, though its botanical relations were not yet ascertained.

Dr. Mackay then shewed two drawings of a monocephalic monster, and gave a minute account of its anatomical peculiarities. Sir Charles Bell thought that this was a case on which nothing new could be said. The records of medicine abounded with accounts of monsters. The President, Dr. Cooper, Professor Jeffrey, and others, made a few remarks; after which Dr. Mackay stated that this is the first case of the kind in which an anatomical account has been given; and G. St. Hilaire mentions that only two similar instances are on record.

[It may be observed that many papers, &c., of this Section are unfit for publication in a popular journal, however interesting to the Faculty and valuable to Science.]

Dr. P. Newbigging then read a paper 'On the Internal Use of Croton Oil in Nervous Diseases.' He stated his belief that it had a specific influence in such cases. The usual dose

administered was a drop. Dr. Abercrombie was inclined to agree with Dr. Newbigging in believing that it had a specific, independent of its purgative, effect in many nervous diseases. In convulsive affections Dr. A. had tried croton oil with eminent success. In the crowing disease of children to which Dr. N. had alluded, he would rather recommend a trial of a combination of carbonate of iron, rhubarb, and musk. Sir Charles Bell thought that in neuralgic cases mere purging would not do. We ought to look out for remedies which affect particular parts of the intestinal canal. The croton oil was very excellent in those neuralgic cases where the head was affected. Dr. Fowler of Salisbury also thought that it was in this class of cases that the croton oil was useful; and in this opinion Drs. Bacon and Lawrie of Glasgow concurred. Dr. E. Mackay stated, that when under Dr. Nicol of Inverness, as house-surgeon of the infirmary of that place, he had frequently used the croton oil as a counter-irritant in neuralgic cases with great advantage. Erythema followed the application in four hours. The strength of the ointment employed was a drachm to one ounce of lard. Dr. Buchanan of Glasgow remarked that, when applied externally, it often produced the same effect as when taken internally. Dr. Nicol of Inverness agreed in this opinion, and said that, as an external application, he was in the habit of advantageously combining it with tartar emetic ointment. Dr. Seargent had given carbonate of iron and rhubarb as a substitute for calomel to children, in the class of cases alluded to by Dr. Abercrombie. Dr. Perry also highly approved of tonic treatment and change of air in these cases. He reprobated the purging system.

Dr. Lawrie of Glasgow then read a memoir 'On the Results of Amputation.' Sir Charles Bell said that this paper *must* be printed; it was of immense value. Dr. Abercrombie stated that it was another admirable instance of the application of statistics to medical subjects. After some remarks from Drs. Perry and Bacon, Sir Charles Bell said, "If you talk of amputations after diseases of the joints, you get favourable results—after tumours of the bones, &c., most unfavourable. It seems to me that the immediate dressing the stump prevents many fatal consequences. The deaths after amputation are so much influenced by the state of the kidneys, &c., that this point might have been perhaps more attended to by the author." Dr. Lawrie remarked that he had attempted to give due prominence to these considerations, and in proof of this referred to his memoir.

Dr. John Reid then read a very important paper 'On the Communication between the Mother and Fœtus (human),' altogether unsuited to our columns. The President said that this communication was of extreme value. It was quite new to the profession, and placed us in advance in one of the darkest subjects of physiology and anatomy. Dr. Martin Barry congratulated Dr. Reid on filling up a desideratum in medical science; and an examination of the preparations shewn by Dr. R. convinced Dr. B. of the correctness of Dr. R.'s statements. Professor Allen Thompson concurred with Dr. Barry, that in this matter the merit of originality must be given to Dr. Reid. It is most satisfactory to find different opinions coalescing. The beautiful arrangement of the placental vessels, and the similarity with the branchial vessels of fishes and other similar structures, was highly interesting; and those familiar with the researches on unity of organisation would from this draw additional evidence of their correctness. Dr. Seargent asked if Dr. Reid ever discovered any difference in the blood in the umbilical vein and umbilical artery? Dr. Reid could not speak on this point from personal observation. He had never had an opportunity of examining it.—It fell more under the notice of accoucheurs. It was then resolved to print Dr. Reid's paper.

Dr. Reid then read a communication received from his friend, Dr. Robert M. Glover, of Newcastle, 'On the Therapeutic and Physiological Effects of Bromine and its Compounds;' when the Section adjourned.

SECTION F.—*Statistics.*

1. Dr. Chalmers, 'On the Application of Statistics to Moral and Economical Questions.'
2. Dr. Cowan, 'On the Vital Statistics of Glasgow, illustrating the Sanatory Condition of the Population, with Suggestions for its Improvement.'
3. Dr. Alison, 'Illustrations of the Practical Operation of the Scottish System of the Management of the Poor.'

Dr. Chalmers's paper 'On the Application of Statistics to Moral and Economical Questions,' was one which created the greatest interest, both for strangers and inhabitants. The room assigned for this Section was accordingly crowded long before eleven o'clock, and multitudes besieged the entrance in vain. Here the patient curiosity of the successful Intrusionists was sorely tried; for, after much deliberation in the Committee, it was agreed to transfer the business to the College Church. This being announced about a quarter to twelve o'clock, the outsiders had far the best of the start, and the company from the interior had to follow as fast as they could. The church was well filled in a few minutes; Lord Sandon took the chair in the precentor's seat below the pulpit; and the Rev. Doctor proceeded to read his paper, which certainly rewarded the feeling its promise had excited, by its strong sense, bursts of eloquence, and the importance of the question it involved. The great principle enforced was that of locomotion in the administrators of succour to the poor, and the dispensers to all of rational education and religious instruction. Those who wished to enlist others must move to them, and not, on mere invitation, expect that the latter would come to them. As an illustration, he would suppose they wanted a petition numerously signed to be presented to parliament. How could they best effect this?—By going with it from door to door, and house to house, and seeking the persons to affix their signatures. The example of their neighbours, and the consequence of taking home and explaining the business to them, would procure a vast number of names; whereas, if they simply left their petition at stated places, and told the people to go there and sign it, they would find that thousands would not be at the trouble of crossing the street to do so. This was an example of what might be called the impulsion of individuals on the masses, the only true way of stimulating the action required; it was fruitless to leave these masses to their own *vis inertiæ*. The Doctor then went on to illustrate his proposition by particular cases. He instanced a community in Edinburgh, consisting of 1350 persons, about the Water of Leith,—carters, quarrymen, pig-feeders, and other of similarly low class, the majority plunged in vice and immorality, habitual Sabbath-breakers—the surest source of all profligacy; for if they traced the latter to its origin, they would invariably discover that the Sabbath-breaker was also the worst-conducted during every other day of the week. Well, looking at human nature with the view he, and those who were with him, entertained of it, they founded their hopes of success not upon mere preaching on the Sunday, but on the minister's going among the people, taking an anxious concern in their well-doing, and enforcing the precepts of morality and religion upon their minds: in short, in not leaving them to act of their own accord, but to shew them what was for their benefit in persevering visits, and court them to adopt that course for their own and their families' sakes. They anticipated that even among the rudest of Nature's children they would, by such means, find access to their hearts and homes; and they had not been disappointed. Vain were the speculations of romantic enthusiasts, built upon poetical fancies of innocent rural life, and the demoralised habits of the dwellers in populous cities and towns. The same susceptibilities of nature existed in the town and in the country; the human being in either was alike sensible of kindnesses, of attention shewn to their offspring, of consolations administered to them on their death-beds, in the hour of trial, when all other considerations were as nothing; and then were they, indeed, impressed with that reverential regard for the Man of God shedding the halo of religious truth and hope round their sore distress and sufferings. Thus the instructor and benefactor acquired the influence he sought. Kindness and assiduity finally triumphed. They would attend their humble funerals as sympathising with them; they would offer remedies for their ignorance; they would impart letters to the young, and religion to the old. These obvious Christian duties, reiterated and concentrated, could not fail of victory, no matter where they were exercised. The urban and the rural were the same races. The former were not the simple patriarchs of the retired and quiet world, or the happy swains of Arcadia, any more than the latter were destitute of every sense and virtue. No; human nature was the same in hovels and bustle as in the most beautiful scenery; and to work out good for either they must appeal to the same emotions and the same sympathies of humanity.

[These sentiments were expressed in a manner of which we regret our inability to convey an adequate idea to our readers. The best short-hand might preserve the words, but the discourse must have been heard to form a notion of the rich Doric accent and Attic eloquence with which its leading points were enforced on the audience, so as to extort plaudits even in the sanctity of the church.—*Ed. L. G.*]

Dr. Chalmers continued to describe the measures adopted by the little association, of whom he formed one, and another of whom was a zealous missionary, upon whose personal exertions he bestowed great praise, and the gradual success that attended their labours. They turned an old malt-barn into a chapel, and they hung up an old manufactory bell to summon the people to worship: it was not remarkable for musical sound to be sure, but it could be heard; and it was no matter how common were the instruments through which such endeavours were carried into effect. They, more than on aught else, depended upon their domiciliary visits; and through them became perfectly convinced of the truth of the saying, "*A house-going minister makes a church-going people.*" Within two months, in the year 1836, the malt-barn was attended by 364 regular hearers; the chapel, previously, in the district, by not more than five; the proportion was as seventy-three to one: and this was the advantage of the Aggressive over the Attractive system. It shewed that by this means alone could they expect to recover a generation from the vice

and heathenism to which they had been born and bred, till custom rendered every other method useless. The learned Doctor energetically contended for the marked value of the statistics of a small subdivision of territory over those of more comprehensive range. The investigation of large fields were of necessity superficial, and brought no certain information upon which the inquirer could rely. Men might make wide surveys of the world, of a whole country, or of a densely populated town; but they would acquire ten times the insight into the conditions they wished to examine for the sake of founding a beneficial practice upon them, by confining themselves to parish, household, or even family observation; thereupon to improve the whole economics of society. Only by drudgery and minute details could they accomplish this, and lay down the basis and a sure substratum of any certain science. But this was not the way of the hard and heartless Utilitarians, who had no thought of acting on the emotions and sympathies of their fellow-creatures. They seemed to fancy that the moment a man began to feel he ceased to discern. They were Osteologists in morals, and wanted only the skeleton and dry bones for their studies. They were experimenters on the dried specimens of nature; and hated the freshness of the living subject. They reminded him of what he had heard of Burke, who, when he began to speak had the effect of emptying the House of Commons. The members could not believe that his brilliancy of style could be combined with the most philosophical and recondite of logical reasoning and powers of generalisation. Not so with the Greeks of old, who had but the same word to express truth and beauty. The τὸ καλὸν was the expression of those who gloriously held that nothing could be true which was not beautiful, nothing beautiful which was not true. Dr. Chalmers next proceeded to give another illustration of the subdivision of territory by a reference to Glasgow, where, so far back as 1816, he had divided a single parish, with 11,000 inhabitants, into forty distinct and independent operations. This parish was broken up into a congeries of Sabbath schools on the aggressive principle, the effects of which all turned upon the difference of seeking and being sought after. When the children were left to themselves, not more than 100 attended the Sabbath schools; but on the aggressive principle being instituted, the yield amounted to 1200 of the juvenile population. As another illustration of the same principle, the Doctor stated that he had met with equal success in the institution of little home-sewing schools for girls, in the parish of St. John's, Glasgow. This species of education, he observed, was peculiarly required here, and all similar towns, where many girls were called to work in public works, just at the time they would be sent to learn to sew, and this branch of domestic duty was afterwards neglected. In the district to which he alluded the girls were, from habits or from other causes, negligent of learning to sew; but a number of ladies, always the best friends of the poor, exerted themselves to find out those who were in that situation. The application of statistics here was in ascertaining that six female schools, with 300 scholars each, would meet the demands of 9000 of a population; and having completed arrangements, they succeeded, through these means, in restoring character and comfort to a hitherto neglected class of individuals. The Rev. Doctor then entered into the subject of "localisation" in the government of large towns. Here he adverted to the views brought out in the paper read yesterday, in which a general police over the city and suburbs was recommended by one who was better qualified than he was to deal with such matters. He alluded to this for the purpose merely of shewing the value of "localisation." He was confident that it was beneficial to the population to have local magistrates, such as those of Calton, Gorbals, and Anderston. He believed there was an attempt made to sink the local magistracy in England. He would not, however, enter into that subject, but would refer them to a pamphlet by Sir F. Palgrave, who had done him the honour to quote his views. In regard to the experiment at the Water of Leith, as a means of producing a diminution of crime, he referred to the evidence of a Commissioner of Police in Edinburgh, in which the latter accounted for a marked improvement in the condition of the people, by referring to the exertions of a faithful minister being settled amongst them. There was one advantage of statistics, that through that science you more readily arrive at the real principles of the subject you are investigating. Suppose you wish to ascertain the character and condition of a district, you come more readily at the end in view by carefully investigating a part of it, instead of adopting more general and extended views. Unless justice was done by this mode of strict and successive experiment in regard to crime, the means of improvement to a great extent must be overlooked. By statistics applied in this way you are enabled to form a correct idea of the general mass, and to arrive much sooner at the discovery of causes. He then came to the establishment of extensive Boards for the management of the funds for the support of the poor. In them he felt other feelings obtained than those of humanity on the one hand, and those of respectful solicitation on the other, and thus the institutions became to a certain extent ineffectual. If the maxim "*Divide et impera*"* in any case held good, it might be applied to the subdivision of pauperism. It might be applied to the study of any of the sciences—as, for example, the establishment of a single experimental farm might lead to a universal result in the science of agriculture.

We believe we have omitted in its proper place to allude to an interview which Dr. C. had with Lord Lansdowne in 1837, in which he had told his lordship of the success of his Water of Leith experiment; and he mentioned now, that the state of the case was infinitely more favourable. There were fifteen similar plans in operation in Glasgow, and 130 in all Scotland; and all of them productive of the best results. He hoped statistical accounts of these, and others, would hereafter be transmitted to the British Association, for the statistics of morals were far more important to mankind, for their reform and amelioration, than were those of pauperism, or crime, or deaths. General statistics could never enable us to ascertain the real causes of crime so as to lay down a system for its diminution. Yesterday, they had been told of the corrective means; to-day he had endeavoured to impress upon them the more effectual character of the preventive. By it, within the limited sphere of the Calton, crime, from 573, had been reduced to 394;—such were the consequences of aggression, and this course he most earnestly recommended. He was opposed, in the treatment of pauperism, to all national and extensive management; and, on the contrary, held that separate, independent, and limited interference could alone be effectual. It must be carried on without complication, or co-operation, with other parishes or bodies. Great Unions and Boards could not properly perform the duties required. Their doings were too noticeable; and a great expense was accompanied by a great public blaze inconsistent with the work to be done. Public views and public institutions could not take cognisance of individuals and particulars. They created a greater distance between the distributors of charity and its recipients, so that their necessities were unknowing of, and unknown to, each other. Thus the Commissioners were led to become either too easy to the claims of the undeserving and clamorous, or too resistant to the claims of the really unfortunate and distressed. They had no means of distinguishing the one from the other, which could be acquired only by localising. The philosopher, emulous of fame, looked over a wide field in which he could see only the objects which are palpable; but the careful inquirer took a microscopic view of minute objects, confident that in the end he would come to a more satisfactory result. Let those who would ameliorate the condition of their fellow-men recollect that the burden of philanthropy did not rest on the shoulders of one man. He would find it enough to accomplish the contribution of a part for the good of society, others would follow in another, or perhaps the same field. Let us be contented, then, to do our own duty in our narrow sphere and little day, and leave it to Him whose agents we were to accomplish the generalisation as a blessing to the human race.

Lord Sandon observed that he had, perhaps, as chairman, allowed the argument to wander almost into a forbidden track; but after the delight they had experienced from this noble address (in many of the sentiments in which he cordially agreed), he hoped he need offer no apology to the Section (applause).

Lord Monteagle, on the same grounds, moved a vote of thanks to Dr. Chalmers, which was carried by a unanimous show of hands.

Dr. Alison's 'Illustrations on the Management of the Poor' in our next.

SECTION G.—*Mechanics.*
Papers and Communications.

1. Wallace's 'Smoke Protector.'
2. Hawkins's (Model) 'Bakewell's Anglo-Meter.'
3. Rayner's (Model) 'Machine Regulator.'
4. Smith's (Model) 'Canal Lockage.'
5. Fairbairn's 'Iron as a Material for Ship-building.'
6. Hodgkinson's 'Strength of Pillars.'
7. Fairbairn's 'Raising Water from Low Lands.'
8. Hodgkinson's 'Clegg's Safety-Lamp.'
9. Rev. J. Brodie's 'Uniform Propelling Wheel.'
10. Dunn's (Model) 'Improved Working Barrel.'
11. Dr. Farquharson's 'Sea-borne Vessels.'
12. Evans's 'Anthracite Pig-Iron.'

Sir J. Robison in the chair. — The proceedings in this Section on Friday were more numerous than important, though several of the subjects were of practical utility.

Mr. Wallace exhibited and explained his apparatus for enabling persons to enter places on fire without danger from smoke, by means of breathing through water. A box of tin, containing the water, is placed on the man's back with tubes connected, forming a ring round the body and straps for the shoulders. A hood of Macintosh cloth, glazed in front, is put on the head, and being attached to the side tubes, four

* In pronouncing these words, the Doctor made a false quantity, which raised a laugh among the Southern classic listeners: but he recovered himself with much good humour by observing, that the English were apt to consider the Scotch, and other people, as provincials in this respect; though, in point of fact, the Scotch pronounced the Latin in the same broad manner as Continental nations. They were, therefore, the court; and the English, who stood alone in clipping the language, were the country cousins.

gallons of water will enable a person to bear the densest smoke for twenty minutes. Several members expressed their high opinion of the Protector, and explained its analogy to some other plans in present use in London and elsewhere. It resembled the diving apparatus in appearance.

Mr. Hawkins exhibited a small instrument, made by Mr. Bakewell, for taking the angle of the dip of strata, whether the surface seen is above or below the strata. This is accomplished by a spirit-level, which can be placed above either the higher or lower limb of the 'Anglo-meter,' which has a scale of degrees at its apex. A small compass is attached to the spirit-level to shew the direction of the dip. The instrument was much approved of.

Mr. Rayner exhibited a wheel for regulating the speed of machines, such as cotton-mill spindles. It was described by some members as being merely a modification of the expanding pulley, and as liable to several objections. It was asserted that the best instrument of this kind was that by Mr. Houldsworth, jun., of Manchester.

Mr. Smith, of Deanston, exhibited a model of a new plan of canal lockage; the advantages of which he stated to be that the descent in each lock would not be more than twelve to eighteen inches, that the locks were opened by the passage of the vessels, that they shut of themselves, that the vessels did not require to stop, and that little or no water was lost. The lock-gate is hinged at the bottom; the upper portion, which is round, floats at the level of the higher part of the water, and is pressed down by the bow of the vessel in passing, and when it has passed rises to its former position. A long conversation took place on the subject, during which the highest opinion was given of the value of the invention to canal navigation. Mr. Smith mentioned that a trial was to be made on the Great Canal.

Mr. Fairbairn read a paper on 'Iron as a Material for Ship-building.' He went into the subject of the extent to which the strength of iron plates was affected by the rivet-holes, and the general deduction made from his experiment was that there was a loss equal to about thirty-two per cent. A conversation followed as to the comparative strength and safety of iron boats, in which it seemed to be a general opinion that they were preferable to wood in these respects. Mr. F. was urged by several members to give his paper to the public, from the valuable matter it contained on this question, and seemed himself to be so fully confirmed in the superiority of iron, that he predicted it would entirely supersede wood in the course of four or five years.

Mr. Hodgkinson then read a paper relative to a series of similar experiments made by him on the strength of iron pillars. It appeared from these that a pillar, square at top and bottom, was about three times as strong as one rounded at the ends—that if the pillars were not placed perfectly perpendicular, at least two-thirds of their strength was lost—and that they were one-seventh stronger when swelled in the middle, like the frustrum of a cone with the base in the centre. A short conversation ensued, in the course of which Professor Wallace suggested that Mr. H. should try the experiment with various curves, which that gentleman readily promised to do.

Mr. Fairbairn next exhibited a model of an engine for raising water, which he had suggested for the purpose of draining the lake of Haarlem, in Holland, which covered upwards of 50,000 acres. It was his opinion that this could be accomplished by the application of a Cornish engine of from 200 to 300 horse power, attached to a scoop 30 feet square, the one end of which was made to move on a centre. In the bottom of this scoop, which was curved, were several valves, opening upwards, on the side nearest the engine. By the descending stroke of the engine, this side was immersed in the water, and filled by the valves. The returning stroke, or rather the weights attached to the other end of the beam, raised the scoop, and threw the water into a canal at a higher level than the lake. Such an engine as he proposed would lift seventeen tons of water at each stroke, and make seven or eight strokes a minute. The average depth of the lake was ten feet. The engine was so constructed as to give the dipping of the scoop a longer or shorter stroke as required.

A Member gave a short account of the mode adopted in draining some of the fens in England, which was done by an engine, on Watts' principle, turning a kind of bucket-wheel, and raising the water into the adjoining river. This gave rise to a long but inconclusive conversation on the comparative merits of these modes of draining.

Mr. Hodgkinson produced a miner's lamp, invented by a Mr. Clegg, near Oldham. It was in principle the same as that of Davy's, but was inclosed in a triangular lantern, with three bull's-eye glasses. The object was to get rid of the danger arising from the use of Davy's, which, should it fall or upset, let the flame through the wires, and caused an explosion. In this lamp that danger was obviated, as there was gauze on the air-holes of the lanterns; and it had this excellent property, that whenever there was danger the light went out. The model was much commended.

The Ordinary on Friday was fully attended; and in the evening the promised Promenade, in the handsome room appointed for it in the Exchange, was crowded. The local newspapers state that, among the company a few of the swell mob (from the South, or London, as they say) found their way among the honest bodies of the West, or Glasgow, and ingeniously possessed themselves of certain monies in their pockets, or the pockets of their visitors, and of sundry watches and trinkets of use to their owners. Some amusement was produced by a new feature in these assemblies, viz. an opposition wine-shop against the apartment where tea, coffee, and cakes, were dispensed gratuitously. Strangers, not being aware that the former refreshments were, like the "pyes and porter," or "whisky," so frequently and conspicuously announced in the illuminated street lanterns, "sold here," rashly adventured upon the champagne, (fancying, poor ignorants! that it would cost them nothing), when, to their astonishment and dismay, they had no sooner discussed a bottle, or swallowed a glass, than they were pulled with "Nine shillings to pay for that, sir," or "that's a shulling, mem." The scene was indescribably droll; and the apprehensive looks with which some of the parties afterwards applied to the tee-totaller's table, dreading another charge, added much to the fun of the entertainment.

TERRESTRIAL MAGNETISM.

The following paper, referring to a matter which now occupies the attention of the whole civilised world, and which stood first on the list of Section A, but was delayed till Tuesday 22, when read by Major Sabine, seems to us to be so important as to claim a place in this week's *Literary Gazette*.

'Report of the Committee consisting of Sir John Herschel, Mr. Whewell, Mr. Peacock, Professor Lloyd, and Major Sabine, appointed to draw up Plans of Scientific Co-operation relating to the subject of Terrestrial Magnetism, and to report to the Association. Grant of 400*l.* at Birmingham. — "In consequence of the measures adopted as detailed in the last Report of this Committee, a very extensive system of magnetical corresponding observations has been organised, embracing between thirty and forty stations in various and remote parts of the globe, provided with magnetometers and every requisite instrument, and with observers carefully selected and competent to carry out at most, if not all, the stations, a complete series of two-hourly observations, day and night, during the whole period of their remaining in activity; together with monthly term observations, at intervals of two minutes and a half. Of these observations, that at Dublin, placed under the immediate superintendence of Professor Lloyd, has been equipped and provided for by the praiseworthy liberality and public spirit of that metropolis. Those at Toronto, the Cape, St. Helena, and Van Dieman's Land, as also the two itinerant observatories of the Antarctic Expedition, by the British Government. Those of Madras, Simla, Sincapore, and Aden, by the East India Company. To which are to be added ten stations in European and Asiatic Russia; two by Austria, at Prague and Milan; two by the Universities of Philadelphia and Cambridge, in the United States; one by the French Government, at Algiers; one by the Prussian, at Breslau; one by the Bavarian, at Munich; one by the Spanish, at Cadiz; one by the Belgian, at Brussels; one by the Pacha of Egypt, at Cairo; and one by the Rajah of Travancore, at Trevandrum, in India. In addition to this list, it has recently also been determined, at the instance of the Royal Society, by the British Government, to provide for the performance of a series of corresponding observations, both magnetic and meteorological, in the Royal Observatory at Greenwich, under the able superintendence of the Astronomer Royal. At Hammerfed, in Norway, negotiations have been for some time carrying on for establishing an observatory of a similar description, in which M. Hanstein has taken an especial interest. A great number of magnetic and other instruments, available for this service, it appears, have been left at Kaafiord, by M. Gaymard, acting for the 'Commission Scientifique du Nord,' under the direction of the French Ministry of the Marine — all which instruments, through the efficient intervention of M. Arago, it is understood, will be placed at the disposal of the observer or observers who may be appointed to conduct the observations. To complete the establishment, however, certain instruments, as well as registry-books, &c., are still requisite. The Council of the Royal Society have undertaken to supply these from the 'Wollaston Donation Fund.' As regards the magnetic observatory at Breslau, under the direction of M. Baguslawski, your Committee have to report, that in order to secure the establishment of that station, and to place it on an equal footing with the rest, certain instruments, &c. required to be provided, for which no funds existed or could be made available on the spot: viz. a bifilar and a vertical force magnetometer, with the requisite reading telescope, and a set of registry-books. As owing to the actual circumstances of that observatory there appeared no prospect of these requisites being

otherwise supplied, as the station appeared to your Committee a desirable one, and as M. Baguslawski was willing and desirous to lend his aid to this great combined operation, by taking on himself the laborious duty of conducting the observations, your Committee conceived that, although possibly transgressing in some degree the strict wording of their powers, they were only acting up to their spirit in devoting a portion (185*l.*) of the funds placed at their disposal, to supplying them at the expense of the Association. Unwilling to claim any privilege, or establish any precedent of the smallest deviation from the strict liberal interpretation of a money grant, your Committee suggest to the meeting the propriety of ratifying, by an express act of recognition, this application of the above-mentioned sum. A letter from M. Baguslawski, dated 22d July, 1840, announces the safe arrival of the instruments and books in question, and the consequent complete state of instrumental equipment of the Breslau Observatory; expressing, at the same time, his sincere thanks for the assistance accorded to him. By returns for several stations authorised by the British Government, so far as yet received, it appears that the observations at the Cape and St. Helena might be expected to be complete and ready for the reception of the instruments in May. From Van Dieman's Land no accounts have yet been received. At Toronto, where the greatest delays and difficulties were to be expected, and have been experienced, the observatory was so far advanced, at the date of Mr. Riddell's last communication, as to leave no doubt of its completion in time for the regular observation of the August term. Meanwhile in this, as in all the other stations, all observations practicable under the actual circumstances of each are made and regularly forwarded; and here the Committee would especially call attention to the extremely remarkable phenomena exhibited at Toronto on the 29th and 30th of May, when, by great good fortune, a most superb aurora appeared at the very time of the term. Observations (see table of the terms, 'Report of Council of Royal Society,' p. 38,) on the phenomena of this aurora (which was remarkable for the extent and frequency of the *pulsating waves* alluded to in that part of the report above cited (p. 47), relating to this subject), are very minutely and scientifically described by Mr. Riddell. But what renders the occurrence presently interesting is the fact, that during the whole time of the visible appearance of this aurora on the night from the 29th to the 30th, as well as for some hours previous, when it might be presumed to be in progress, though effaced by daylight, all the three magnetical instruments were thrown into a state of continual and very extraordinary disturbance. In fact, at $6^h\ 25^m$ on the morning of the 29th, the disturbance in the magnetic declination during a single minute of time carried the needle over 10′ of arc; and during the most brilliant part of the evening's display (from $3^h\ 25^m$ Gött. M. T. ditto $4^h\ 35^m$), the disturbances were such as to throw the scales of both the vertical and horizontal force magnetometers out of the field of view, and to produce a total change of declination, amounting to 1° 59′. It should also be remarked, that the greatest and most sudden disturbances were coincident with great bursts of the auroral streamers. The correspondence, or want of correspondence, of these deviations with the perturbations of the magnetic elements observed in Europe and elsewhere on the same day, cannot fail to prove of great interest. Should it fortunately have happened that Captain Ross has been able to observe that term at Kerguelen's Land, which is not very far from the antipodes of Toronto, an indication will be afforded whether or not the electric streams producing the aurora are to be regarded as diverging from one magnetic pole or region and converging to another. Your Committee cannot conclude this Report without congratulating the Association, and the scientific world in general, on the vast range of observation consequently embraced by this operation; which, so far as any accounts have hitherto reached them, appears to be so far going on prosperously in all its parts, and to promise results fully answerable to every expectation of its promoters. Neither would they feel justified in their own eyes, were they to omit expressing their deep and grateful sense of the indefatigable personal exertions of Major Sabine throughout the whole of the progress, both in carrying on a most voluminous correspondence—in ordering, arranging, and despatching instruments—and facilitating, by constant attention and activity, those innumerable details which are involved in a combination so extensive—a combination which, but for those exertions, your Committee are fully of opinion must have been greatly wanting in the unity of design and co-operation which now so eminently characterise it."

The following report of the proceedings of the concluding General Committee Meeting on Wednesday, was unavoidably omitted in our last: we did not think it advisable to break in upon the Sectional business of the first day, nor to curtail the address of the General Secretaries:—

Glasgow, Wednesday, Sept. 23d.

The Session has closed. At half-past five the Marquess of Breadalbane terminated this busy week by returning thanks for, at the General Meeting in the Theatre, a vote of thanks proposed by Principal Macfarlane, and seconded by Mr. James Stuart Menteith (of Closeburn), and carried by loud acclamation. There is now but the Lord Provost and Magistrates' Dinner in the Town Hall to attend, and all will be over—"the pomp and circumstance of glorious" science.

Previous to this, however, the General Committee met at two o'clock, when the minutes of the meeting of Monday were read and confirmed. The London Council for the ensuing year were nominated and approved of.

The Auditors were also appointed, and Mr. Taylor stated that the amount of money received at this meeting was 2610*l.*

The number of tickets issued		1353
Namely, to new Members	995	
Old Life Subscribers	211	
Old Annual Subscribers	107	
Foreigners	40	
		1353

Major Sabine explained that the Committee of Recommendations had been constituted on a new principle, by which every Section was represented by members belonging to it. He then proceeded to read the recommendation of grants, divided, as heretofore, into three classes.

1. Money grants;

2. Appointment of Committee for Reports which did not involve any expenditure; and

3. Representations to government.

The grants proposed for Section A, and subsequently for the other Sections, were then read, and afterwards agreed to.

First Class.

A. Hourly Meteorological Observations in Scotland: Sir D. Brewster and Prof. Forbes	£85	0	0
For Tide Discussions: Professor Whewell	50	0	0
For Tide Observations, Bristol: Professor Whewell	50	0	0
For Barometric and Thermometric Instruments	£20	0	0
For the Reduction of Meteorological Observations, under the superintendence of Sir J. Herschel	100	0	0
Nomenclature of Stars	50	0	0
For the Reduction of Lacaille's Stars, under the superintendence of Sir J. Herschel, Professor Airy, and Mr. Henderson	104	5	0
For the Reduction of Stars in the *Histoire Celeste:* Mr. Baily, Professor Airy, and Dr. Robinson	150	0	0
To Extend the Royal Astronomical Society's Catalogue, on condition that it should be called 'The British Association Catalogue:' Mr. Baily, Professor Airy, and Dr. Robinson	150	0	0
For Tabulating Observations of Anenometer: Mr. Osler	40	0	0
For Osler's Anenometer at Inverness	60	0	0
For Two Actenometers, to enable Professor Agassiz to make Observations in the High Passes of the Alps: Major Sabine	10	0	0
To Ascertain the Action of Gases on the Light of the Solar Spectrum	75	0	0
For Tabulating Annual Observations at Plymouth: Mr. Snow Harris	20	0	0
For Tabulating Barometric and Thermometric Observations: Mr. Snow Harris	35	0	0
For the Reduction and Tabulation of Observations on Subterranean Temperature: Professor Forbes	20	0	0
For Magnetical Observations, Instruments, &c.: Sir J. Herschel, Professor Whewell, and others	50	0	0
	£1149	5	0
B. For the Translation of Foreign Scientific Memoirs: Major Sabine, Dr. R. Brown, Dr. Robinson, Sir J. Herschel, and Professor Wheatstone	100	0	0
For Experiments on the Action of Sea Water on Cast and Wrought Iron: Mr. Mallet	50	0	0
On the Functions of Digestion: Mr. Prout and Dr. Thomson	200	0	0
	£350	0	0
C. Researches on the Mud of Rivers	20	0	0
President of Royal Society, President of Geological Society: for Maps and Coloured Drawings of Railway Sections, before they are covered in	200	0	0
To enable M. Agassiz to report on the Fossil Fish of Scotland, especially those in the old red sandstone	100	0	0
Temperature of Mines in Ireland: Mr. Portlock	10	0	0
To Register Shocks of Earthquakes in Scotland and Ireland: Lord Greenock and others	20	0	0
Solution of Silica in water of high temperature	25	0	0
	£375	0	0
D. For Experiments on the Preservation of Animal and Vegetable Substances: Professor Henslow, Mr. Jenyns, Dr. Clark, and Professor Cumming	6	0	0
For Engraving Skeleton Maps for recording the Distribution of Plants and Animals: Professor Graham and others	25	0	0
For Researches with the Dredge, with a view to the Investigation of the Marine Zoology of Great Britain	50	0	0
Britannica: Sir W. Jardine and Mr. Selby	50	0	0
Lists of Plants and Animals in Waters: Mr. Lankester	6	0	0
Experiments to prove the longest period the Seeds of Plants retain Vegetation: Professor Lindley	10	0	0
Questions on the Human Race: Mr. Pritchard	15	0	0
	£162	0	0
E. For Experiments on Acrid Poisons: Dr. Roupell	25	0	0
For Experiments on Medico-Acoustic Instruments	25	0	0
For Investigations on the Veins and Absorbents: Dr. Roget	25	0	0
	£75	0	0
F. To give Encouragement to obtain Numerical Analysis of Education in Great Britain: Mr. Porter and others	100	0	0
Vital Statistics: Colonel Sykes	100	0	0
Statistics of Mining Coal Districts of Great Britain: Professors Johnston and Heywood	25	0	0
	£225	0	0
G. Experiments on Steam-Engine Condensers: Mr. Taylor and Mr. Fairbairn	25	0	0
For the Purchase of Roberts' Instruments for Measuring short Intervals of Time: Sir J. Robison, &c.	30	0	0
Dynamics of Steam-Engine Duty: Mr. Moseley	100	0	0
For Experiments on the Forms of Vessels: Sir J. Robison, Mr. J. S. Russell, &c.	100	0	0
	£255	0	0

Section A	£1149	5	0
B	350	0	0
C	375	0	0
D	162	0	0
E	75	0	0
F	225	0	0
G	255	0	0
Total	£2591	5	0

Second Class.

Professor Airy, 'Second Report on the Progress of Astronomy in Present Century.'

Professor Airy and Major Sabine, 'On the best Method of Publishing the Hourly Meteorological Observations now in Possession of the British Association.'

Rev. Mr. Willis, 'On the Phenomena of Sound.'

Dr. Peacock, 'On the Differential and Integral Calculus.'

Sir W. Hamilton, 'On the Application of a General Principle in Dynamics to the Theory of the Moon.'

Professor Kelland, 'On the Undulations of Fluid and Elastic Media.'

Professor Kelland, 'On the Conduction of Heat.'

Professor Bache, 'On the Meteorology of the United States.'

Mr. Lubbock, Sir J. Herschel, &c. 'Whether it is of Advantage to ascertain State of Higher Atmosphere by Balloon Ascent?'

Professor Johnston, 'Inorganic Chemistry.'

M. De la Rive, 'On Electro-Magnetism.'

Professor Johnston, 'Chemical Geology, especially in reference to the Igneous Rocks.'

Sir J. Dalzell, 'On the Habits of the Radiated Animals.'

Mr. Williams and Mr. Fairbairn, 'Combustion of Coals, to ascertain the greatest Calorific Effects and least Smoke.'

Mr. Hodgkin, 'On the Resistance of the Atmosphere to Moving Bodies.'

Mr. Smith, 'On Turbine Water-Wheels.'

Professor Wheatstone, 'On Vision.'

Dr. Daubeny, 'On the Connexion between Agriculture and Chemistry.'

Third Class.

'Representation to Government on the Reduction of the Greenwich Observations.'

At the conclusion of the reading of the several classes of Reports, on the motion of Mr. Strickland, after some discussion, it was resolved, that a recommendation should be submitted to the General Council to alter the time of sectional meetings at future annual meetings, for the following reasons:—

"*Proposed new Arrangement of the Times of the Sectional Meetings.*

"There can hardly be a member of this Association who has not experienced the great inconvenience, and frequent disappointment, which arises from the circumstance of all the Sections being held simultaneously. So intimately are the different branches of science connected together, that no person can be attached to any one science without taking a certain amount of interest in others; and yet, from the peculiar constitution of this Association, the members are in general debarred from attending any other Section than that with which they are more peculiarly connected. This evil is particularly felt by the officers of the Sections, who are generally tied down during the whole of the week to their own department, and remain in unwilling ignorance of all that takes place in the other Sections. How different is the rotation of the meetings of scientific societies in London, which are so arranged that cognate subjects are never discussed simultaneously. I am indeed well aware, that if all the Sections met in succession, and none of them simultaneously, these meetings, instead of lasting a week, would be protracted to a month; but I wish to inquire whether the evil in question might not be, in some measure, though not wholly, obviated by an arrangement differing but slightly from the present one. Under the present arrangement, the Sections meet daily from 11 to 3 during five days; making a total of twenty hours of business. In lieu of this plan, I would propose that the Sectional Meetings should be divided into two classes, viz. *Morning Meetings*, from 10 to 1, and *Afternoon Meetings*, from 1 to 4; and that they should be so arranged, as that the allied subjects discussed at the meetings should interfere with each other as little as possible. Thus I would propose that Section A, of Mathematics and Physics; Section C, Geology; Section E, Medical Science; and Section F, Statistics, should all meet simultaneously at 10 A.M.; and that Section B, Chemistry and Mineralogy; D, Zoology and Botany; and G, Mechanical Science, should all meet at 1 P.M., immediately on the termination of the previous series of Sectional Meetings. By this arrangement, the mathematician, on the breaking up of his Section, might follow the bent of his tastes, into the rooms of Chemistry or of Mechanical Science; the Plutonic geologist would proceed to the Section of Mineralogy, and the studier of organic remains would leave his fossiliferous rocks for the existing fauna displayed in the Zoological Section. The medical man might then proceed from his own peculiar department to the Section of Chemistry or of Botany, in which subjects he is equally proficient; and the studier of Statistics might attend any Sections which may be connected with his favourite pursuit. It is evident that, if such a plan were adopted, the Sectional Meetings would be far better attended than they are at present, and this arrangement would suit the convenience of a much greater number of persons than is now the case. In places where a sufficient number of suitable meeting-rooms are not to be had, one Section might follow another in the same room; so that, in cases of necessity, four spacious apartments would suffice for the meetings of all the seven Sections. To counteract the deficiency caused by each Section meeting daily for three hours only instead of four, I would propose that the meeting should break up in future on the Thursday instead of the Wednesday. The Sections would then meet on six days instead of five, producing a total of eighteen hours of business for each Section; and I feel satisfied that the mutual accommodation caused by this arrangement would more than recompense the majority of the members for the additional day to which the meeting would thus be extended. Should it be objected that the above arrangement would not leave sufficient time for the meetings of the Recommendation Committee, I would propose, that the additional evening gained by the extension of the meeting to Thursday instead of Wednesday should be devoted to a meeting of that Committee. Should one evening not suffice, the Recommendation Committee might meet again on one of the promenade evenings.

"HUGH E. STRICKLAND,
Member of the General Committee."

The General Meeting at the Theatre was well attended. Particulars in a future Number.

ORIGINAL CORRESPONDENCE.

ERUPTION OF MOUNT ARARAT.

St. Petersburg, Sept. 11, 1840.

THE "Northern Bee" of yesterday publishes the following letter, dated Tiflis, August 1:—

"You have doubtless heard of the terrible earthquake of Mount Ararat, which has entirely destroyed the town of Nakhitchevan, damaged all the buildings at Erivan, and devastated the districts of Scharour and Sourmala in Armenia: all the villages in these two districts are destroyed. The ground is cleft in such a manner, that all the plantations of rice and coffee have perished for want of water. But the most awful event has taken place in the vicinity of Ararat. Only conceive that a vast mass was loosened from the mountain, and destroyed every thing in its course for seven wersts (nearly five miles); among others, the great village of Akhouli has experienced the fate of Herculaneum and Pompeii; more than a thousand inhabitants were buried under heaps of rocks. A thick fluid, which afterwards became a river, rushed from the interior of the mountain, and taking the same direction, swept away the mass which had fallen, carrying along with it the corpses of the unfortunate inhabitants of Akhouli, the dead animals, &c. &c. The shocks continued to be felt every day in the two above-mentioned districts, and completely laid them waste; they afterwards became less frequent, and Mount Ararat is not yet quiet. I was awakened the day before yesterday by two distinct subterraneous shocks."

St. Petersburg, Sept. 15.

The earthquake of Mount Ararat has likewise done much damage at Erivan. The walls of the fortress are injured, and many houses thrown down. But that town is not the only one that has suffered, nor was it the force of the phenomenon. Other towns, some of them at a great distance, many convents and villages in the plain of the Araxes, are said to have suffered severely. We hear that the earthquake proved most destructive to the village of Arauri, situated amidst vineyards and plantations of apricot and mulberry trees. It is said to be totally destroyed; perhaps by the mass that was precipitated from Mount Ararat; for Arauri was at the mouth of the deep cleft which begins several thousand feet higher up, and the sides of which are nearly perpendicular. The beautiful village of Arauri had 175 families, that is about 1000 inhabitants, of whom not a trace remains. It would be remarkable if this great volcano, which has been perfectly quiet as far as history goes back, should now become an active volcano.

This phenomenon is probably connected with that at Baku, of which we lately gave some account; but we have not the precise dates of the two events.

ARTS AND SCIENCES.

ON ORGANIC MALFORMATIONS.

[Full as we are, at this period, of scientific matter, the following communication contains so much that is new and interesting that we cannot refrain from inserting it, even amid the masses of the British Association. We are sorry that we had not the MS. at Glasgow, where it would have formed a very valuable paper for the Section (D) of Natural History. However, we are not only desirous to present it among our notes of their proceedings, but also on account of the announced close of this Exhibition in a week or two, and put all our readers on their guard not to omit visiting a place so replete with curious and important instruction.—*Ed. L.G.*]

On Organic Malformations, and the Production of Monsters and Twin-Birds within the same Shell, in the Eggs of the Common Fowl.

By William Bucknell, F.Z.S. &c.

MY observations having now extended over upwards of 20,000*. birds, hatched artificially under every variety of condition, and nearly a like number also in every stage of developement, some data are afforded whereby to judge of the influence which extraneous circumstances, affecting the outward conditions to which the egg must necessarily be subjected in order to develope life, have in producing structural malformation, and other defects usually considered as consequences of improper treatment during the process of hatching. The results of my experience go to prove, that no alterations or variations of the conditions essential to the developement of life, viz. heat, moisture, and air, induce malformation within the

* The number at this present date, September 23d, exceeds 30,000.

shell. The only effects (with slight exceptions hereafter named) produced by improper treatment being either increased excitement, or languid action of the vital principle, both alike destructive, sooner or later, of life itself. This may appear somewhat surprising from the fact, that a large proportion of the birds hatched artificially in Egypt are wanting a leg, a wing, or a claw, or are otherwise malformed; which defects have always been attributed to improper hatching: further, it has also frequently been affirmed that any particular malformation, or deformity, can be produced in any egg by covering certain portions of the shell with varnish, thereby preventing the ingress of air through its pores at those particular places, and by such means impeding the developement of the nascent bird. From above 20,000 birds, hatched under every variety of circumstance, not more than one per cent has been found in any way defective; and it is also true that such defects were the result of improper hatching, and could be satisfactorily assigned to their determining causes: such as a contraction of the claws of the feet, which generally followed an administration of too much heat, or deformity of the whole limb —a not unfrequent occurrence if the liberation of the bird was impeded, so that it remained too long a time in the singular position it assumes within the shell: but these are exceptions, and not the rule. We must look, then, to other causes than the presumed one of improper hatching to account for the almost universally defective state of the Egyptian birds, which I consider to arise solely from the degeneracy of the breed; and no efforts having been made to improve it, these peculiar defects are propagated from parent to offspring. Although it be true that a lame mother will not necessarily produce a lame progeny, yet where deformity is almost universal, and has continued through generations for many centuries, it is not improbable to suppose that such deformity may have become at length hereditary. With regard to a coating of varnish placed over certain parts of the shell, producing a peculiar malformation of organic structure, it is only necessary to observe that such coating could not affect any organ in particular, from the fact of the chicken within constantly changing its position as the egg is moved: these presumed discoveries, therefore, may be safely pronounced as belonging to the region of fable. Of the 200 birds, being a proportion of one per cent of the 20,000, which I have found deformed, it should be observed that it was *deformity merely*; not a single instance of the absence of an entire limb, or even of a single claw, has ever occurred: this per-centage also includes the results of my experimental attempts at hatching. The average of defective birds by the most approved mode of eliciting life does not amount to one half the above estimate,—a proportion certainly not above what occurs in the natural way. It thus appears that no outward circumstances or conditions influence the developement of organisation, otherwise than if such circumstances or conditions are favourable thereto, the developement of the bird proceeds unto its perfect state. If unfavourable, such developement is impeded, not in any particular limb or organ, but uniformly throughout the whole organising structure, and life either immediately or eventually destroyed. How admirable is this arrangement! Were it otherwise, from the diversity of circumstances to which the eggs of birds are exposed, how infinite would be the number of deformities throughout these various tribes of the animal creation! As it is, the effect of this simple law gives to outward circumstances no other control over their formation than either to develope or to destroy. With respect to the production of monsters, or twin-birds, either united or separated within the same shell, my observations are of very limited extent: they go, however, very far to shew the fallacy of several commonly received opinions upon the subject. I have experimented at different times upon a large number of what are called double-yolked eggs, considered to be such from their remarkable elongation and large size, and, like most other eggs of unusual size, they invariably proved abortive. After ascertaining this fact I have broken them to examine their contents, and have never, in a single instance, found a double yolk in any of them (of course, at that period I could not ascertain whether the cicatricula had been impregnated or not); and in no respect did they present any difference of appearance from other abortive eggs. 40,000 individuals had now passed under my observation, and I almost began to despair of ever obtaining this long-sought phenomenon, when, to my inexpressible gratification, on Monday morning last (April 20th, 1840), when breaking an egg to procure a specimen at six days of incubation, out tumbled a double fœtus in the highest state of perfection. The following are the phenomena attending them:—The egg was of the middle size, of good form, and presented outwardly no unusual appearance. There was no double yolk, or double quantity of albumen: both fluids bore the usual relative proportions to each other. The chalazæs were the same as in other eggs. The two bodies appeared to be disunited; if joined, the connexion was at the head, with the bodies separating in a lateral direction from each other, the two extremities forming the base of a triangle. Each fœtus had advanced perfectly as far as six days of incubation. The two hearts were at a distance of about half-an-inch from each other, four salient points were in action in each; the pulsations (in consequence of excitement) at first were 160 per minute, gradually they reduced in number, and ceased entirely at the expiration of half-an-hour. It presented altogether one of the most splendid sights for a physiologist ever witnessed. The vascular area in which the blood is illiminated was common to both, and not larger than is usual to a single fœtus at that period of its incubation. Not the slightest appearance of a junction of two membranes was visible. These two latter facts are particularly remarkable. The size of each was rather smaller than is usually presented by a common fœtus in an egg of similar size. The amnios, if one and entire, was exceedingly bilobed, as may be inferred from the lateral position of the bodies to each other. This, also, is an exceedingly singular fact, supposing the amnios to have been single. Such were the appearances which presented themselves at a first view, without dissection or disturbance, which I was unwilling to do until after a drawing had been taken, and further investigations made by some eminent physiologist. This design, however, was frustrated, to my great regret, by my servant, in his over-carefulness to preserve the specimen, upsetting the saucer in which it was placed, and thereby destroying it. It thus appears that the production of monsters, or twin-birds, in the same egg, are of exceedingly rare occurrence—only one in 40,000 in my experience. Nor are they produced in the larger eggs, nor in eggs possessing double yolks, but depend upon the presence of two impregnated cicatriculæ upon the surface of the same yolk. It is worthy, also, of observation, to note that I have, in several instances before, discovered what I have conceived to be two cicatriculæ upon the same yolk, one impregnated, and the other not, but never both having the appearance of impregnation. They were always apart from each other; and the most remarkable phenomenon attending those just described is, that with an apparent separation of the two bodies there was but one vascular membrane. From this circumstance, I should conclude, that an union of both birds at the abdomen would have taken place at the completion of incubation. Had the vascular area common to both been of unusual size, instead of being about that of a single fœtus, it is evident there would not have been a sufficiency of fluids in the egg to have brought them to maturity. The same result must also have ensued had each fœtus had a vascular membrane peculiar to itself; but in this instance, a single membrane supplied nourishment to both bodies in common; and its extent of surface not being greater than is usual to a single fœtus, the developement of the organs as regards size was proportionate only to the supply of nutrient matter; and, although perfect in every respect, so far as that stage of advancement (the sixth day), were therefore smaller than usual. It is, however, very doubtful if two birds could occupy the same shell without its producing deformity, from the unnatural position they must necessarily sustain within it.

The Ecclectic, April 24th, 1840.

PARIS LETTER.

Academy of Sciences, Sept. 22, 1840.

SITTING of September 14.—M. Cauchy read a memoir 'On a Method of Determining the Coefficients of the Series in Formulæ for Calculating the Perturbations of Planetary Movements.' In a previous paper, read in 1831, the author had disclosed a method of calculating each coefficient separately: he now announced new methods and formulæ leading to the same result, but more simple, and tending to abridge labour. M. Liouville had shewn that the coefficients in the developement of the function R, expressing the perturbations, might be represented by certain definite double integrals, and in certain cases he had shewn methods of reducing their approximate values to those of simple integrals. M. Cauchy now shewed that this reduction was possible in all cases, and without neglecting any values: his formulæ also led to some important theorems in the theory of planetary movements.—M. Mathieu read a memoir 'On a Method of M. Lucchesini for resolving various Arithmetical Problems by means of a Formula of Proportion.'

Fossil Elephant Bones.—Messrs. Rivière and Briggs presented to the Academy several fragments of fossil elephant bones, found in a sand-pit between Champigny and Joinville le Pont. They were in the midst of a stratum of fine quartzose sand, which was full of fragments of shells, and covered by a layer of gravel and large boulders, coming from the silicious millgrit or from the chalk-flint formations. The section of the sand-pit was as follows:—Vegetable earth and alluvium, thirty to forty centimetres; flinty diluvial deposit, one metre; diluvial sand, representing the gypseous marls of Montmartre, four metres. The average level of the sand-pit, which is very rich in fossil bones, is higher than that of the Marne or the Seine.—M. Walferdein communicated the exact note of the temperature at the bottom of the Artesian well at Grenelle, as recently determined: it was 26·43 degrees of the centigrade

scale, at a depth of 505 metres. Hence, since the mean temperature at the surface is 10·6 degrees, it may be inferred that the temperature increases one degree for every 31·9 metres of depth. Similar experiments in the well of the Observatory had given one degree of increased temperature for every 32·3 metres of increased depth: at the Military School it was one degree for every 30·85 metres; and at St. André, in the Eure, one degree for every thirty-one metres.

An absorbing well has just been formed in the fossé of the Château de Vincennes to carry off the stagnant water: the bore has been made 300 feet deep; and in the plastic clays lying over the chalk there has been found a stratum of sand which, in a few days, absorbed three-quarters of the water of the fossé. M. Degouseé, who was intrusted with this operation, has been ordered by the Minister of War to make an Artesian well at Lille for the Military hospital.

The Scientific Congress of France closed its eighth annual sitting at Besançon, on the 15th inst. Its next meeting is to take place on the 1st of September, 1841, at Lyons.

Italian Scientific Congress.—The second annual meeting of the *Scienziati Italiani* commenced at Turin on the 15th inst., under the presidency of the Count Alexander di Saluzzo, President of the Academy of Sciences of Turin. A considerable number of Italian men of science had enrolled their names on the 12th, 13th, and 14th,—most of them from Tuscany, and the other northern states of the peninsula; a few from Naples; none, that we are aware of, from Rome. Very few foreign names of distinction appear on the list of members this year. Among those that do, we find Decandolle of Geneva, and Messrs. M'Culloch and H. Lloyd of Dublin, as well as Professor Tiedemann, of Heidelberg.

The following is a list of the Sections, with their officers, places, and hours of meeting:—

1. *Medical Section.*—*President:* Professor Tommasini. *Vice-President:* Professor Griffa. *Secretary:* Professor Martini. Meets in the Theatre of the University, from two to four, P.M.

2. *Geological and Mineralogical Section.*—*President:* The Marchese Lorenzo Pareto. *Secretary:* M. Pasini. Meets in the Hall of the Royal Academy of Sciences, from nine to eleven, A.M.

3. *Physical, Chemical, and Mathematical Section.*—*President:* Il Commendatore G. Plana. *Vice-President:* Professor Configliachi. *Secretaries:* Professor Mossotti and Professor Belli. Meets in the Theatre of the University, from eleven to one.

4. *Agronomical and Technological Section.*—*President:* Dr. Gera. *Secretary:* Professor Milano. Meets in the Theatre of Chemistry of St. Francesco di Paola, from eight to ten, A.M.

5. *Botanical and Vegeto-physiological Section.*—*President:* Professor Moris. *Secretaries:* Professor Devisiani and Dr. Masi. Meets in the Theatre of Chemistry of St. Francesco di Paola, from eleven to one.

6. *Zoological and Comparativo-anatomical Section.*—*President:* The Prince di Canino e Musignano. *Vice-President:* Il Cavaliere G. Carena. *Secretary.* Dr. Filippo de Filippi. Meets in the Hall of the Royal Academy of Sciences, from one to three, P.M.

The general meetings are held in the Great Hall of the University.

On the 15th, all the members attended high mass at the church of St. Filippo, and then divided themselves into their several Sections. The government and all the local authorities of Turin have, by his Sardinian majesty's express desire, shewn every possible attention to the members of the Congress: all the public establishments are thrown open to them, and every thing is done to promote the objects of the meeting. The following is a brief summary of the topics discussed on Thursday, the 17th inst.:—

1. *Medical Section.*—Introductory discourse of President. Dr. Thaon read a memoir 'On the Cure of Cancer of the Heart,' according to a method of his own. Dr. Linoli read a paper, in which he denied the reproduction of organic tissue. This led to a long discussion, in which Professor Pasero, Dr. Bellingieri, and Professors Cornegliano, Riberi, Rossi of Parma, and Nardo of Venice, took part.

2. *Geological Section.*—Opening discourse of President. Letters, excusing absence, were read from M. Elie de Beaumont of Paris, and Professor Domnandos of Athens.—A memoir was read, from M. Guidoni of Massa, 'On the Conversion of Dark-coloured Limestone into Dolomite, or Saccharoidal Marble.' A discussion ensued on the general theory of 'dolomisation,' between the Signori Sismonda, Pasini, De Filippi, and the Marchese de Pareto.—A letter from Professor Domnandos, of Athens, 'On the Remains of Fossil Mammiferæ in Oriental Attica,' was read.

3. *Physical, Chemical, and Mathematical Section.*—Opening discourse of the President. Professor Mossotti moved that, during the interval of each annual meeting of the Congress, one or more of the members should be instructed to draw up a synoptical account of the proceedings of the last meeting, to be presented to each member on the first day of the ensuing meeting. Professors Pasini and Configliachi seconded this motion, which was reserved for future discussion. A letter was read from the Rev. Canon Bellani, upon the question whether the formation of hail took place in the upper or the lower regions of the atmosphere, and on the necessity of having new observations carefully made relative to this phenomenon.

4. *Agronomical and Technological Section.*—Introductory discourse of President, including a brief notice of the agricultural meeting of Mileto. The Marchese Ridolfi invited all the members to visit another year his agricultural institution. Signor Rampinelli read a memoir 'On the Rearing of Silkworms, and on the Suffocation of the Chrysalides.' Professor Ragazzoni, Dr. Gatta, the Cavaliere Santa Rosa, the Avocato Dubois, and Signor Rampinelli, discussed this point. The Cavaliere Bonafous read a notice 'On the Method of Colouring the Cocoons, by mixing colouring matter in the Food of the Insects.'

5. *Botanical Section.*—Introductory discourse of President, including a notice on the services rendered to science by Italian botanists. The Avocato Colla read a memoir 'On a Convolvulacea of the *Kalonyction* Species.' Professor Visiani read a paper 'On the *Gastonia palmata* of Roxburgh,' as being a type of a new genus (*Trevesia*) of the family of the *Araliaceæ*. Professor Decandolle, Dr. Morris, and Professor Moretti, discussed this point. A letter was read from Professor Brignoli, of Modena, 'On certain Points connected with Botanical and Vegeto-physiological Nomenclature.' Professor Decandolle made some reflections on this subject.

6. *Zoological Section.*—The President thanked the members for the honour they had done him by his election: he paid a tribute of gratitude to the founder of this general reunion of scientific men—Leopold II., grand duke of Tuscany, and introduced two new members to the Section—Professor Tiedemann and Signor De Selys Longchamps.—The Cavaliere Bellingeri read a memoir 'On the Anatomy of the Frog.'—A communication was read from Professor Domnandos 'On the *Catodan macrocephalus*.'—Signor Verany di Nizza gave a verbal notice of his genera *Carinaria cavalinia*, *Eolidia*, *Tethys*, *Aplysia*, and *Bonellia*, and exhibited some beautifully coloured drawings illustrative of them. The President of the Section read a memoir 'On the Animals of the Rat and Mouse Genus indigenous in Italy,' with drawings and specimens of the species described.

Sciarada.

1. Fiume che bagna il Bavaro.
2. Fido animal domestico.
3. Droga, che vien dall' Asia.
4. Nota ben alta in musica.
5. Voce Lombarda e Veneta.

Intero. Arte o virtù diabolica.

Answer to the last:—Salva-guardia.

THE DRAMA.

Covent Garden.—A novel, and we are glad to add a very successful, attempt was made on the stage of this theatre on Tuesday, in the production of a two-act musical drama, from the pen of Mr. Samuel Lover. We say novel, for *The Greek Boy* is written in a very fresh style; ballads, suited to stage or drawing-room, and calculated to be equally successful and popular in either place, being the most attractive feature. The plot is of the slightest description, but this deficiency is more than atoned for by the pleasant music, and still more pleasant words. The interest of the piece turns on the fidelity of a young Greek, who manifests his devotion to his master by plunging into the Adriatic and pretending to rescue from watery oblivion the ring with which the Doge had wedded the sea, and with which alone he had vowed his daughter should be married. By this means, he brings about the union of his master and his lady love. The youthful Greek, having been a goldsmith's workman, is enabled to accomplish this apparent impossibility by forging a pretty correct resemblance of the lost treasure, of which he had been the original engraver. Upon these slight materials Mr. Lover has woven a neat little love-story, and introduced a good underplot, in which Mr. Keeley has a capital part, and plays it capitally. *The Greek Boy* is impersonated by Madame Vestris, who, by her looks, her acting, her dress, and her warbling, puts her audience into the best possible humour with her and with themselves. The *mise en scène* is as it used to be at the Olympic, only on a much larger scale. Every scene, every dress, is most gorgeous; and not only highly creditable to the establishment, but done in such a manner as it is not done elsewhere. The public have to congratulate themselves on the production of this pretty afterpiece as a source of amusement, and we hope Madame will have to congratulate herself on it as a source of profit; which, if the house be nightly filled as it was on Tuesday, must inevitably be the case.

We add a sample of the ballads, which are written and composed in Mr. Lover's pleasantest style; our first is called:—

"Barcarole. Gondolier, row!
Gondolier, row!
How swift the flight
Of time to-night,
But the gondolier so slow!—
Gondolier, row!
The night is dark,
So speed thy bark
To the balcony you know.

Gondolier, row!
One star is bright
With trembling light—
And the light of love is so:
Gondolier, row!
The watery way
Will not betray
The path to where we go."

And if nightly *encores* be a criterion, Mr. Lover never made a more palpable hit than this. Another:—

"*Mark! Lady, mark! or, the Wedding of the Adriatic.*
Mark! lady, mark!
Yon gilded bark
Beareth a duke in pride;
His costly ring
Bravely to fling,
And make the Sea his bride.
Proud of her lord all Ocean smiles,
And with soft waves kisses our isles,
While her own mirror, gorgeously,
Doubles the pomp she loves to see!
Mark! lady, mark!
Yon gilded bark
Beareth a duke in pride.

Oh, why should pride
Seek for a bride
The cold, the faithless Sea?
Vainly we throw
Rich gems below—
She will be false to thee!
Dearer I hold plain rings of gold
Binding two hearts ne'er growing cold.
Proud lord, if thou hast rule o'er the Sea,
Vast as the Ocean true love can be!
Oh, why should pride
Seek for a bride
The cold and faithless Sea?
Mine be the ring
True love can bring,
Such be the ring for thee!"

And yet one more:—

"*Name not Danger, Love, to Me.*
Name not danger, love, to me,
One who loves renown,
There's more peril in love's smile
Than in danger's frown;
Danger we may meet and die,
But the flash of Beauty's eye
Kings cannot resist nor fly,
No, not for their crown.

Danger best becomes the knight:
'Tis what soldiers prize:
For it is the surest plight
For love in woman's eyes.
Welcome, danger, then to me,
So it makes me dear to thee:
Who would not in peril be
For lovely woman's sighs?"

Haymarket. — Mr. Serle's new play of *Master Clarke* was produced on Saturday last with the most triumphant success, but certainly not greater than it deserved. Highly dramatic in its incidents and situations, full of fine and lofty sentiments, and admirably acted, it would, indeed, have been a pity for such offspring to have met with any other than a kindly fate. The play is founded on an anecdote as old as the hills, and hence the name; but as the drama explains that secret we shall not unfold the mystery. suffice it to say, that the period of the play is the time of the Restoration of the second Charles, and that the chief actor is Richard Cromwell. Of the acting we have but to repeat an oft-repeated tale: Mr. Macready, as *Cromwell*, was admirable, and made every line of the author tell; he was most heartily applauded in scene after scene, and at the fall of the curtain was uproariously compelled to make his bow to a delighted audience. As the great interest of the drama is in his hands, a slight notice will be sufficient for the remainder of the *dramatis personæ*. Messrs. Phelps, Lacy, G. Bennett (his first appearance here), Webster, J. Webster, &c. &c. have good subordinate parts, and play them well. Miss Helen Faucit, as *Lady Dorothy Cromwell*, has most arduous work; for it is entirely up-hill, and she has scarcely an opportunity of procuring a single cheer from her audience. She, however, did every thing that could be done with so difficult a character, and deserves especial praise for making so much of so slight materials. The only fault (and what is perfect?) of *Master Clarke* is its want of lightness, though it is not without its comic characters, fairly sustained by Messrs. Strickland and Oxberry, and Mrs. W. Clifford.

On Tuesday, the most successful revival and reappearance we ever witnessed were made together; the revival was Macklin's glorious comedy, *The Man of the World;* and the reappearance, Mr. Maywood, after many years' sojourn on the other side of the Atlantic; and a most hearty welcome he met with on his return to the London boards. Few of the present generation of playgoers can remember Mr. Maywood's predecessors in the arduous part of *Sir Pertinax Mac Sycophant*, though of course there are many who must recollect the delineation of the character by Mr. Young, and even by Mr. Cooke: even with these Mr. Maywood will not hurt by the comparison, for his conception is as different from theirs as possible. Cooke was the slow, calculating, sleeky Scot; Young much in the same school: Mr. Maywood took a very original view of the part; and though he was at times boisterous, yet he had his audience so fairly with him, that with the same humour he must have carried them on, even had his acting been less forcible and effective. He was well played "up to," and consequently made some of the most cutting satires tell, though the age is past when their severity was felt. Mrs. Stirling was the *Lady Rodolpha*, and, with a fair Scottish dialect, acted most charmingly; and Mr. Phelps was an excellent *Egerton*. Mr. Webster has done the play-going world some service since he has been a caterer for their amusement; but nothing he has yet provided will be so agreeable to them as the capital variety he will now have an opportunity of offering them in the revival of the sterling old Scotch comedy. On Thursday a new farce, called *The Unfortunate Youth*, was produced, but without success.

Strand.—*The Perils of Pippins* was revived for Mr. Hammond's benefit on Monday, and has been attracting during the week. It is very amusing.

The Princess's Theatre. — This long-talked-of theatre was opened to the public on Wednesday; but, in consequence of the badness of the arrangements, we are able to say but little this week farther than that the interior of the house is most gorgeous, and that the building seems well adapted for promenade concerts and that species of entertainment. The music, on the first night, was continually interrupted by the pleasing accompaniment of a hammer and saw: but these are difficulties that may be overcome, and we hope we shall be able to report more favourably in our next.

English Opera. — The original promenade concerts have resumed business here, and as successfully as ever.

Drury Lane is making preparations for a winter campaign, under the title of the *Concerts d'Hiver*, with the celebrated Musard for leader; and the *Adelphi* is announced for Monday with a new piece founded on the French Revolution, in which Mrs. Yates is to make her first appearance since her long and serious illness: and if ever the Adelphi were full it ought to be on such an occasion, when hundreds of admirers will flock to greet and welcome so great a favourite. Wieland and Mrs. Keeley are of the company, and come out in farce.

VARIETIES.

Geology in America.—Mr. D. D. Owen, a gentleman of very high scientific attainments, the son of the celebrated Robert, and now settled at New Harmony, has been engaged during all the last autumn by the Secretary of the Treasury in making a geological survey for the government of the United States, in order to enable the President to propose a plan to Congress for the sale of the public mineral lands. The district examined lay on both sides of the Upper Mississippi, chiefly in Iowa and Wisconsin, between the forty-first and forty-third degree of latitude, and comprehending an area of about 11,000 square miles, equal in extent to the state of Maryland. A hundred and forty persons were employed by Mr. Owen in this extensive expedition, so that he might be able to make his report in time to be acted upon as early as possible. It was finished in May, and will probably be published immediately at Washington. At present all we know of it is, that it is not only rich as a vast agricultural district, but contains the most important lead regions perhaps in the world. The territory was the seat of Black Hawk's war in 1832-3, and has, since the purchase of the land from the Indians, been the point in the far west to which the tide of emigration has been flowing.

Berkshire Ashmolean Society.—This Society, whose formation we noticed some time since, has attained a rapid increase in the number of its members, amounting nearly to 200. Their first publication is already in a state of forwardness, and will consist of the "Annals of the Abbey of Abingdon," from a manuscript in the Public Library of the University of Cambridge.

Vienna, 4th September, 1840.

Duke Paul William of Wurtemburg has arrived here from Constantinople, returning to Germany from his tour in Egypt. The duke went from Fazoglu to visit the rich gold mines of Bertat and Kamamik, and, in company of the expedition under Ferhad Bey, penetrated into the hitherto wholly unknown mountains of Fakarno and Sudé. He found the accounts of the richness of the Cascalhos of this country by no means exaggerated, and fully coincides with the opinion of Russigger and Boriani, as given in their reports to Mehemet Ali. The duke cannot find terms to express his admiration of the luxuriant vegetation of those countries of Central Africa which are covered with primæval forests, and of the variety and abundance of all classes of the animal kingdom; the collections of both which he has brought home are said far to exceed any that have hitherto been brought from those countries. The duke made the journey back chiefly by land, and describes the heat during the months of April and May as almost intolerable. He fell in with the expedition of Selim Capitana, with whose success in exploring the Bahr al Abiad we are already acquainted, and was so fortunate as to obtain the greater part of its collections of natural history, and others. The duke visited the ruins of Masuarat, discovered by Caillaud, and the Pyramids of Assur, the resemblance of which to the old Egyptian is evident.

Wedded Love.
Let wedded love be like the tire,
The wheel of life to grasp,
Gain more of force when less the fire,
And, cooling, closer clasp. I. O.

Sorrow.
Our joys are known from feeling wo:
If life were always pleasure,
'Twould be as some be-tinsell'd show
That shone,—not real treasure.

But Sorrow is the truest friend,
And tears bring joy the surer,
As leaves that to the rain-drops bend,
Rise the refresh'd and purer. P. S.

Ewell.

Epigramma Elegantissimum.

Alderman Harmer he would be *mayor*,
But "The Times" does so abuse him,
Making "The Dispatch" their stalking-*horse*,
That the Livery will refuse him.

ORIGINAL POETRY.

A FABLE.

THE Duck went a swimming; Good-lack!
She came like a little boat back;—
And she said to the Sow, as she roll'd in her sty,
"How is it you neither can swim nor fly?"
"I shall fly next week," said the arrogant Sow;
"But as to the swimming, I'll do it now."

So she took to the water; Good-lack!
The old lady never came back—
For a sow is constructed, in carcass and limb,
After a fashion not likely to swim,—
Still, drowning, she grunted, "I don't care a groat!
I'll swim with the best, if I cut my own throat!"

Now we come to the moral; Good-lack!
That morals so oft should be slack!
Like the Sow, there are people of boundless conceit—
Small wits, who will never confess they are beat:
They would fly without wings, taking infinite pains
To prove to us all that they've heads without brains.

R. J.

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September.	*Thermometer.*	*Barometer.*
Thursday .. 24	From 44 to 55	29·49 to 29·59
Friday 25	.... 47 .. 54	29·70 .. 29·98
Saturday .. 26	.... 37 .. 59	29·98 .. 29·84
Sunday 27	.... 43 .. 63	29·90 .. 29·91
Monday .. 28	.... 49 .. 59	29·74 .. 29·52
Tuesday .. 29	.... 48 .. 57	29·52 .. 29·61
Wednesday 30	.... 42 .. 57	29·84 .. 29·90

Prevailing wind, south-west.

On the 24th, cloudy, with frequent showers of rain; the 25th, morning cloudy, with rain, otherwise clear; the 26th, morning clear, afternoon and evening cloudy, with small rain; the 27th, generally clear, raining during the night; the 28th, a general overcast, raining generally all the day; the 29th, and following day, generally clear; rain, at times, on the afternoon of the 29th.

Rain fallen, ·835 of an inch.

Edmonton. CHARLES HENRY ADAMS.

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